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FINAL REPORT

A STUDY FOR THE
OLD WEST REGIONAL COMMISSION

BY
MOUNTAIN WEST RESEARCH, INC.
DECEMBER 1975

The Old West Region Commission is a Federal-State partnership designed to solve regional economic problems and stimulate orderly economic growth in the states of Montana, Nebraska, North Dakota, South Dakota and Wyoming. Established in 1972 under the Public Works and Economic Development Act of 1965, it is one of seven identical Commissions throughout the country engaged in formulating and carrying out coordinated action plans for regional economic development.

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MOUNTAIN WEST
RESEARCH INCORPORATED

January 17, 1976

Ms. Jeannette Studer
Old West Regional Commission
The Fratt Building
Suite 306A
Billings, Montana 59101

Dear Ms. Studer:

Enclosed is the CONSTRUCTION WORKER PROFILE: FINAL REPORT prepared by Mountain West Research, Inc. The report describes the principal findings of the Project, Household, and Community Surveys and describes the results of some of the analyses carried out with the data.

Mountain West is particularly appreciative of the help received from you and other members of the Old West staff, and of the cooperation of both public and private sector representatives that allowed the survey work to proceed. We hope that the results of the study will be useful in a wide range of applications. If we can be of further help in explaining our procedures or results, please contact us.

Sincerely yours,

MOUNTAIN WEST RESEARCH, INC.

Dwayne H Jelinek

Dwayne H. Jelinek
President

DHJ:sr

Encl.

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THE CONSTRUCTION WORKER PROFILE STUDY

The CONSTRUCTION WORKER PROFILE was conducted for the Old West Regional Commission to study the socio-economic consequences of the construction of large energy-related facilities. The emphasis of the study was on the collection of primary data, and three distinct efforts were required.

- A **Household Survey** was conducted which consisted of door-to-door interviews with 1432 households in nine western communities which have been affected, are being affected, or will be affected by large energy-related construction projects. The purpose of the household survey was to determine household and labor force characteristics, commuting patterns, residential preferences, social integration, household expenditures, satisfaction with community services, and attitudes of residents about both the projects and their community. Respondents to the household survey included residents who lived in the community prior to the construction project(s) and, in the case of currently affected communities, newcomer construction workers and other newcomers. For the post-impact communities, a sample of all residents was interviewed.
- A **Project Survey** was undertaken which consisted of distributing and collecting short self-administered questionnaires to construction workers at 14 major construction sites in eight western states. A total of 3168 responses was obtained which indicated workers' characteristics with respect to household composition, place of residence, previous residence, and occupation.
- A **Community Survey**, during which three social scientists lived for a time in three of the Household Survey communities, and conducted structured, in-depth interviews with households and less structured interviews with institutional representatives, was the third activity of the study. The purpose of this procedure was to determine some of the construction period impacts on the personal lives of community residents and on the communities' institutions, and also to observe both individual and institutional response to those impacts.

The results of the study are summarized in 10 documents.

I. CONSTRUCTION WORKER PROFILE: FINAL REPORT
Purpose: To provide a detailed account of the purpose, method, and results of the study. Emphasis is placed on generalizations supported by the data with special attention to the applicability of the results to the planning and impact assessment processes.

II. CONSTRUCTION WORKER PROFILE: SUMMARY REPORT
Purpose: To make the objectives and principal findings of the study easily accessible to the nontechnical reader.

III. CONSTRUCTION WORKER PROFILE: COMMUNITY REPORTS
A. Green River and Rock Springs, Wyoming
B. Forsyth and Colstrip, Montana
C. Center, North Dakota
D. Langdon, North Dakota
E. Conrad, Montana
F. Killdeer, North Dakota
G. St. George, Utah

Purpose: To prepare seven distinct community reports containing descriptions of the Household Survey findings for individual communities and summaries of information from the Project Survey on projects relevant to each. Due to the proximity of Rock Springs to Green River and of Forsyth to Colstrip, the community reports for each of these pairs of communities were combined in single volumes under the assumption that anyone interested in one would be interested in the other.

IV. CONSTRUCTION WORKER PROFILE: USER'S GUIDE TO THE DATA
Purpose: To document the methodology, procedures, and results of the study so that the basic data can be used by other researchers. The entire data set is described in detail as are the procedures for obtaining the data on tape, punched cards, or hard copy.

Distribution of Publications:
The documents described above are available on request from
Old West Regional Commission, 1730 "K" Street, N.W., Suite 426, Washington, D.C. 20006

Distribution of Data:
The procedures for the distribution of data are described in the USER'S GUIDE TO THE DATA. Questions about these procedures may be directed to:

Ms. Jeannette Studer, Old West Regional Commission, Fratt Building, Suite 306A,
Billings, Montana 59101, (406) 245-6711, Ext. 6665, OR

Ms. Jan Barringer, Mountain West Research, Inc., 123 E. University Drive, Suite 219,
Tempe, Arizona 85281, (602) 968-7991.

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CHAPTER I

INTRODUCTION

When development of western coal accelerated in the early 1970s, both planners and researchers were frustrated by their lack of information about the characteristics of the construction forces that would be necessary to construct mining, conversion, and transportation facilities. There were bits of information about the experiences of particular communities or about the characteristics of a work force on a single project, but there was no broad set of observations which could serve as a basis for generalizations about the workers or about their effects on the communities in which they settled.

The need for the information was clearly felt in many places. Most conspicuous was the demand associated with the many environmental impact assessments being carried out in the region. These ranged from the intensive study of a single well defined development activity to broader assessments of general programs or development strategies. Without exception, however, more needed to be known about where the construction forces would come from, about where they would settle, and about the consequences of the population influx for existing residents of the areas into which the new workers would move. Similar demands for information were being made by state and local planners as they tried to clarify the implications of different development options for their constituencies.

It was because of these data needs that the Old West Regional Commission contracted for the CONSTRUCTION WORKER PROFILE STUDY in February of 1975. The objective of the study was to collect a broad set of primary data on construction projects and their related work forces that would describe the experiences of communities in the region and document the sources of the impacts they have felt. A related objective was to collect the data with sufficient care and to document it well enough that it would be useful to other researchers with interests in the socio-economic consequences of energy-related development.

In order to meet these objectives, three different data collection efforts were undertaken. The first was referred to as the Project Survey and was designed to get a few, important pieces of information from the construction workers on a large number of projects. The emphasis was on the local/non-local composition of the work force, the subsequent distribution of the non-local workers among the communities in the region, and the extent to which married workers were accompanied by their families.

The second data collection effort was called the Household Survey and was oriented to communities rather than construction projects. The attempt here, therefore, was to obtain a random sample of the construction workers living in a particular community rather than a representative sample of the workers on a project as was the case with the Project Survey. Because the information was collected by an interviewer in the respondent's home, it was possible to pursue a much broader range of questions and to deal with them in more detail than would have been possible at the actual construction site.

The two surveys are complementary in that the detailed information collected in the Household Survey can be inferred to a project on the basis of the attributes known about a project's work force collected in the Project Survey. For example, if it is found in the Household Survey that married workers with three children (families present) spend on the average 80 percent of their family income; and if it is known from the Project Survey that on a particular project 22 percent of the workers are married with three children (families present) then the more detailed income-expenditure information from the Household Survey can be attributed to this subset of the project's work force.

The third data collection effort of the study was called the Community Survey. It consisted of both structured, in-depth interviews with households and less structured interviews with institutional representatives. The purpose was to determine some of the construction period impacts on the personal lives of community residents and on the communities' institutions, and also to observe both individual and institutional response to these impacts.

The structure of this FINAL REPORT is organized around the three separate surveys. Chapters II, III, and IV deal with the Project, Household and Community Surveys, respectively. Chapter II describes the rationale for the Project Survey and the way in which it was carried out, and it gives a detailed summary of its results. Chapter III proceeds in a similar manner for the Household Survey except the discussion of the results is focused on data pertaining to groups of communities. The emphasis in Chapter III is on the newcomer construction worker residents of communities currently affected by large scale construction projects, but information is also presented for newcomers other than construction workers and for long time residents. Chapter IV summarizes the conclusions of the Community Survey. As with the Household Survey chapter, emphasis is on cross-community generalizations, not community-specific discussions.

Chapters II, III, and IV deal in a descriptive way with the results of the study. The purpose of Chapter V is to go beyond description of the data to investigate and to quantify some of the most important relationships that determine the impact of a construction project on the region in which it is located. Hypotheses are developed and tested, and the applicability of the results to the planning and impact assessment processes is discussed. The reader should be warned that there is much in Chapter V that is necessarily technical. An attempt is made to carefully motivate each of the sections and to recapitulate major findings, but commonly used statistical procedures are not explained.

As was explained on the Information Sheet inside the front cover, the FINAL REPORT is only one of several documents that summarize the results of the study. The SUMMARY REPORT deals with the results of the study of greatest general interest, and briefly summarizes some of the analysis described in more detail in Chapter V of this report. Because of the existence of the SUMMARY REPORT, no attempt has been made to provide an overall summary or introduction to this volume except as was briefly sketched above.

The other documents of the study are directed to more specific needs. The seven COMMUNITY REPORTS are designed to meet the needs of persons whose primary interests are in particular geographic areas. Each report contains summary tables on all pertinent information from as many of the three surveys as are applicable. The Rock Springs-Green River COMMUNITY REPORT, for example, contains data for both communities from the Household Survey, data on the Jim Bridger and Texas Gulf Sulphur construction projects from the Project Survey, and the Community Survey results for Rock Springs. For a pre- or post-impact community, however, there would be no Project Survey data, and, except for Langdon, North Dakota, no Community Survey data.

The final document is the USER'S GUIDE TO THE DATA. From the beginning, the intention was that this study emphasize the collection of data rather than analysis. Some preliminary analyses and description have been done in this report, but they represent only a small part of what is possible. It is important, therefore, that adequate documentation exist in order that the information be accessible to other researchers. This is the purpose of the USER'S GUIDE. It attempts to be as precise as possible about the experimental design of the study, about field procedures, and about the way in which the data were processed. Of particular interest to other researchers is the detailed discussion of the sampling procedures used in the Household Survey. The USER'S GUIDE concludes with a description of the procedures and the costs of obtaining the various data sets and data summaries.

CHAPTER II

PROJECT SURVEY: DESCRIPTION OF FINDINGS

I. INTRODUCTION AND OBJECTIVES

The Project Survey was designed to provide the information to determine the distribution of the construction force between local and non-local workers, and to determine whether non-local workers brought their families with them and where they chose to live. Two major problems arose in trying to obtain this information. First, and most serious, there were only a limited number of observations of the crucial relationships. A single project, even though it employed several hundred or even thousands of persons, yielded only a single observation for the local/non-local source of supply analysis. A project might have had 30 percent local workers and 70 percent non-local workers, for example, but in order to study the determinants of this ratio, many projects must be studied for there to be enough information for statistical analysis. The second problem concerned the difficulty of obtaining the necessary information from individual construction workers. Contractors were understandably reluctant to allow this information to be obtained on company time, and a mail questionnaire is always subject to non response problems.

Because of these difficulties, it was decided that an attempt had to be made to survey as many as possible of the major projects (greater than 100 employees) under way during the summer of 1975 in the nine state Mountain Region if a usable number of observations were to be obtained.[1] A total of 14 projects was identified and these are listed in Table II-1. The locations of these projects are shown in Figure II-1. A questionnaire (short enough to be printed on an IBM card) was distributed to all project workers and collected by either company or union personnel. Even though it meant soliciting information from many thousands of workers, this approach proved feasible and a good response was obtained because of the brevity of the questionnaire and the combined cooperation of management and labor personnel.

---

[1] The nine state region comprises the five states of the Old West Region (North and South Dakota, Montana, Nebraska, and Wyoming) and the four states of the Four Corners Region (Arizona, Colorado, New Mexico, and Utah).

TABLE II-1

PROJECTS INCLUDED IN SURVEY INCLUDING LOCATION, OWNER, AND CONTRACTOR.

Project Number	Project Name	Location	Owner	Contractor
1	Coronado 1,2,3	5 miles NE of St. Johns, Arizona	Salt River Project	Bechtel
2	Craig 1,2--Yampa Power Plant	South of Craig, Colo.	Colorado Ute, Salt River Project, et.al.	Stearns-Roger
3	Hayden 2	2 miles east of Hayden, Colorado	Colorado Ute, Salt River Project, et.al.	Stearns-Roger
4	Colstrip 1,2	Colstrip, Montana	Montana Power Co.	Bechtel
5	Center--Milton R. Young	Center, North Dakota	Minnkota Power	Sornsin Foley Bros. Babcock-Wilcox Hewitt-Robins Wheelabrator-Frye
6	Leland Olds	Stanton, North Dakota	Basin Electric	Burns and Roe
7	San Juan 1	Fruitland, New Mexico	Public Service of New Mexico and Tucson Gas and Electric	Stearns-Roger
8	Emery	Between Orangeville and Emery, Utah	Utah Light and Power	Jelco
9	Huntington 2	West of Huntington, Utah	Utah Light and Power	Jelco

(continued)

TABLE II-1 (continued)

Project Number	Project Name	Location	Owner	Contractor
10	Jim Bridger 2,3	30 miles east of Rock Springs, Wyoming	Pacific Power and Light	Bechtel
11	Texaco Lake Expansion	Lake DeSmet between Buffalo and Story, Wyoming	Texaco Oil Co.	Green Construction Company
12	Sun Oil-Cordero Mine	South of Gillette, Wyoming	Sun Oil Company	Fluor Utah Nicholson Wagonhammer Reeves Fairfield
13	Texas Gulf Sulphur	55 miles west and north of Rock Springs, Wyoming	Texas Gulf Sulphur	Brown and Root Stearns-Roger
14	Wyodak	6 miles east of Gillette, Wyoming	Black Hills Power and Light and Pacific Power and Light	Stone and Webster

The next section of this chapter discusses the methodological and procedural considerations on which the Project Survey was based. Following that general discussion, the results for each project are described with respect to the local/non-local composition of the labor force, the distribution of the non-local workers over surrounding communities, the absence or presence of the construction workers' families, the expected number of in-migrants per 100 non-local construction workers, and the occupation distribution of the workers.

The discussion of the results of the Project Survey in this chapter is primarily descriptive. Chapter V addresses the analytic questions of the predictability of the local/non-local mix of workers and of their choice of community.

II. METHODOLOGY

A. THE QUESTIONNAIRE

Copies of both questionnaires used in the study are included in Figure II-2. Questionnaire 1 was used in the pilot surveys at the Jim Bridger and Texas Gulf Sulphur sites outside of Rock Springs and Green River, Wyoming, respectively.[2] As a result of the pre-test, minor revisions were made in the survey instrument resulting in the second questionnaire shown in Figure II-2 which was used for the remaining projects surveyed.

Question 1 provided the information needed to estimate the occupational mix of the construction workers. Questions 2 and 3 provided the information needed to estimate both the number of non-local workers required to construct a project and the types of communities in which the non-local workers will choose to live. Questions 4 and 5 provided the information needed to estimate the size of the non-local construction workers' families. Question 6 provided the information needed to estimate the proportion of non-local workers who will bring their families with them.

---

[2] Questionnaire 1 was also used inadvertently at Colstrip as is explained in the Colstrip-Forsyth COMMUNITY REPORT.

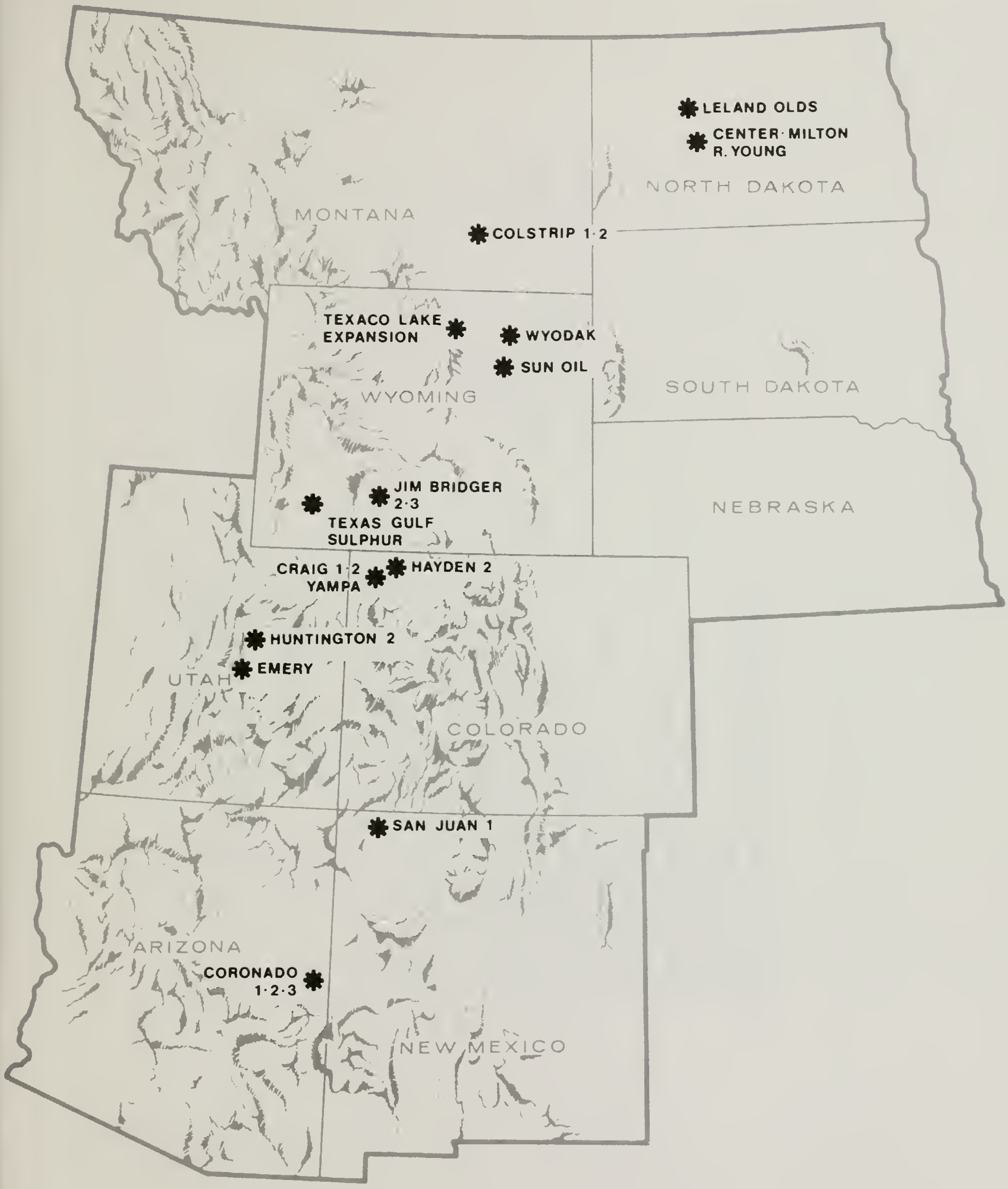

FIGURE II-1

Project Survey Sites

FIGURE II-2

QUESTIONNAIRES USED FOR PROJECT SURVEY

Questionnaire 1

1. What is your occupation (job title)? ______________________________

2. What is your address? (street & town) ______________________________

3. a. Are you living in the same town you lived in before you started working on this job? (Circle one) yes no

   b. If no, where did you live previously? (town & state) ______________________________

4. Are you married or single? (Circle one) married single widowed divorced

   If married, widowed, or divorced,

   a. How many children do you have? ______________________________ children

   b. Is your family (spouse and/or children, if any) living with you now? (Circle one) yes no

   If your family is NOT living with you now,

   1. Where are they living now? (town & state) ______________________________

   2. Did they live there before you started working on this job? (Circle one) yes no

   3. If no, where did they live? (town & state) ______________________________

THANK YOU VERY MUCH FOR YOUR COOPERATION

FIGURE II-2 (continued)

Questionnaire 2

1. What is your occupation (job title)? ______________________ 1______ 2______

2. What is your local address? ____________ ____________ 3______ 4______
Street Town

3. a. Is your local address in the same town as it was before you started working on this job? (circle one) Yes No 5______ 6______

b. If no, where did you live previously? ____________ ____________ 7______
Town State

4. What is your marital status? (circle one) Married Single Widowed Divorced 8______

IF SINGLE, WIDOWED, OR DIVORCED, PLEASE DO NOT ANSWER ANY FURTHER QUESTIONS. THANK YOU.

IF MARRIED,

5. How many children under 18 do you have? ____________ children 9______ 10______

6. a. Is your spouse living with you at your local address (circle one) Yes No 11______

b. If your spouse is NOT living with you at your local address, where is your spouse living? ____________ ____________ 12______ 13______ 14______
Town State

THANK YOU VERY MUCH FOR YOUR COOPERATION 15______ 16______

B. FIELD PROCEDURES

In early planning meetings in which field procedures were discussed with project staff members, Old West Regional Commission staff, state agency representatives, etc., it was suggested that perhaps the best way to approach the workers at the various project construction sites was through the labor unions. Initial introduction would be through the various states' labor coordinators or representatives who would, it was hoped, refer the interviewer to the appropriate local union officials at or near the project site. Introductory and explanatory letters would also be sent to the contracting companies and the project owners. The procedure was to remain, above all, flexible.

As the pilot phase of the Project Survey was started, however, it became obvious that the labor union approach had substantial difficulties. This was caused by the unexpectedly intricate structure of labor organizations. There existed state, regional, and local officials for several unions at each construction site. Coordinating the survey through the involved network of officials would have required considerable time and effort. Moreover, if one official refused to cooperate, the decision would affect many workers, and because of the numbers of officials involved, the possibility of at least one negative response was thought to be fairly high. Furthermore, if a specific union refused to cooperate, there was no other feasible alternative, whereas, if management refused to approve a project interview, the needed information might be obtained from union personnel or files.

Accordingly, it was decided to introduce the CONSTRUCTION WORKER PROFILE study to each project manager with a letter from the governor or the governor's office in each state. After permission to interview was obtained, management at the local level was usually quite cooperative. This cooperation was extended, however, subject to the condition of minimum interference with the workers and the knowledge that the employees were under no obligation to complete the questionnaires.

Table II-2 shows that the questionnaire was distributed to 6310 construction workers and that 3168 usable responses were obtained. This reflects an aggregate response rate of about 50 percent, although, as the table shows, there was substantial variation among projects. For projects 5, 6, and 14, the response rate seems to have been affected by the fact that as is explained in the footnotes to Table II-2, the information was collected as part of a much longer (approximately six pages) interview schedule because other studies were already under way at these sites.

TABLE II-2

QUESTIONNAIRE DISTRIBUTION AND RESPONSE BY PROJECT

Project Number and Name	Distribution of Questionnaires	Response	Response Rate
1 Coronado 1,2,3	152 Bechtel employees	119	.78
2 Craig	488 employees of Stearns-Roger and 12 subcontractors	307	.63
3 Hayden 2	568 Stearns-Roger and 175 Fischbach and Moore employees	483	.64
4 Colstrip 1,2	748 Bechtel employees	161	.22
5 Center--Milton R. Young[a]	507 employees of 15 subcontractors	73	.14
6 Leland Olds[a]	594 employees of 10 subcontractors	193	.32
7 San Juan 1	494 Stearns-Roger employees	234	.47
8 Emery	234 Jelco employees	130	.56
9 Huntington 2	438 Jelco employees	307	.70
10 Jim Bridger 2,3	838 Bechtel employees	503	.60
11 Texaco Lake Expansion	300 Green Construction Co. employees	206	.69
12 Sun Oil--Cordero Mine	199 employees of 6 subcontractors	133	.67
13 Texas Gulf Sulphur	265 Brown and Root and 110 Stearns-Roger employees	227	.61
14 Wyodak[b]	200 employees of Stone and Webster and 5 subcontractors	92	.46
TOTAL	6310 employees and subcontractors	3168	.50

TABLE II-2 (continued)

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[a] The Project Survey for the Milton R. Young and Leland Olds Power Plants was contracted for with Dr. Larry Leistritz of the Department of Agricultural Economics at North Dakota State University (NDSU). As part of a broader study NDSU was preparing, university researchers were going to be visiting the Milton R. Young and Leland Power Plants. NDSU had established and maintained what they felt was a good interview relationship with the power plants' management, and they felt interviewers coming in from the Construction Worker Profile project would be counter-productive for both survey programs. Accordingly, the NDSU group agreed to include questions directed at obtaining the data desired by the Project Survey interviewer on their questionnaire. The NDSU group went on-site at both plants and, through the local management, distributed and collected their questionnaires; the Project Survey data desired was then transferred by the NDSU interview personnel onto the Project Survey IBM card forms.

[b] The survey for the Wyodak mine was carried out under the supervision of Dr. Jim Thompson of the Department of Sociology at the University of Wyoming. Dr. Thompson had previous plans to survey the Wyodak mine and so the decision was made to use information from his questionnaire to avoid jeopardizing both studies. Arrangements were made accordingly and University of Wyoming personnel transferred the specific data needed for the Project Survey onto the IBM card questionnaires used in this study.

Colstrip is the only other project for which the response rate was low and the results for this project should be considered suspect. Communications in order to gain permission to survey Colstrip extended over a long period of time and the questionnaires were ultimately distributed and collected without a member of the study team ever having been physically present at the site. Of the 748 questionnaires distributed to the Bechtel employees, Bechtel management reported that approximately 320 were returned; however, only 161 of these were forwarded to be used in this study because the others apparently contained no useful information. Since non response problems had not been encountered on other projects, it seems likely that the conditions under which the forms were distributed affected the results. In light of these problems, the question remained whether any of the Colstrip responses should be used. Examination of the completed questionnaires revealed that they seemed to have been appropriately completed, and so the 161 Colstrip observations were included in the analysis.

After the interview results were collected, the answers were coded directly onto the IBM questionnaire cards, or, in cases where the cards had been reproduced locally, the data were transferred to cards. A discussion of data processing procedures is contained in the USER'S GUIDE TO THE DATA. The principal results of the Project Survey are summarized in the next section.

III. RESULTS

The Project Survey provides a large number of observations on a small number of construction worker characteristics. The focus is on those characteristics that are critical in determining the socio-economic impact of a construction project. The purpose of the remainder of this chapter is to describe the results of the survey. Some interpretation will necessarily be offered, but the intent of this section is simply to present the results. Chapter V confronts the analytic question of the extent to which the characteristics of greatest interest are predictable.

A. LOCAL/NON-LOCAL COMPOSITION OF THE WORK FORCE

Workers were classified as non-local if their present address was not in the same town as it was before they started work on the construction project. They were classified as local if their present address was in the same town as it was before they started work on the project. Table II-3 shows that of

TABLE II-3

LOCAL WORKERS AS A PERCENTAGE OF TOTAL WORKERS

Project Number and Name	Total Construction Workers	Local Construction Workers	Percentage Local
1 Coronado 1,2,3	119	48	40.3
2 Craig 1,2--Yampa Power Plant	307	129	42.0
3 Hayden 2	483	155	32.1
4 Colstrip 1,2	161	62	38.5
5 Center--Milton R. Young	73	35	47.9
6 Leland Olds	193	86	44.6
7 San Juan 1	234	184	78.6
8 Emery	130	69	53.1
9 Huntington 2	307	142	46.3
10 Jim Bridger 2,3	503	149	29.6
11 Texaco Lake Expansion	206	86	41.7
12 Sun Oil--Cordero Mine	133	57	42.9
13 Texas Gulf Sulphur	227	59	26.0
14 Wyodak	92	3	3.3
TOTAL	3168	1264	39.9

the 3168 construction workers from whom responses were received, 1264, or 39.9 percent were local. Although two projects had extreme values--San Juan was 78.6 percent local while Wyodak was only 3.2 percent local--many of the projects fall close to the average value of 40 percent local. Chapter V examines the variability in the ratio of local to total workers from project to project and the extent to which the ratio seems to be affected by the proximity of population centers or by the competitive influence of other projects in the region.

Another critical question is that of the origin of the non-local workers. If non-local workers represent intrastate or intraregional redistributions of surplus labor, the implications are very different from a situation in which the workers are migrants into the region. Table II-4 shows the distribution of non-local construction workers by state of previous address for each of the fourteen projects. Of the total of 1693 non-local workers who gave usable previous address information, 46 percent were from the same state in which the project on which they were working was located, 20 percent were from other states in the nine state region, and 34 percent originated from outside the nine state region. Figure II-3 expresses the same information, but the flows are expressed as a percentage of total workers rather than just as a percentage of non-local workers and the percentages are calculated separately for the Old West Region and the Four Corners Region. For the Old West States, 33.8 percent of all workers surveyed were local and an additional 24.3 percent were from the Old West Region although they had moved in order to assume their present jobs. Thus, on the basis of these surveys of eight projects in the Old West Region, about 58 percent of the jobs had been domestically filled. To fill the remaining 42 percent, approximately one quarter of the workers came from the Four Corners Region and three quarters from outside the nine state region.

The situation in the Four Corners Region was somewhat different. As might be expected due to its larger population,[3] the Four Corners' projects had only to import about 12 percent of their construction workers. About 46 percent were local workers, and about 42 percent were non-local but had moved from some other location within the Region.

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[3] Populations of the two regions in 1970 were 3,793,586 for the Old West Region and 6,053,430 for the Four Corners Region (U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C.: U.S. Government Printing Office, 1973), p. 1-48.

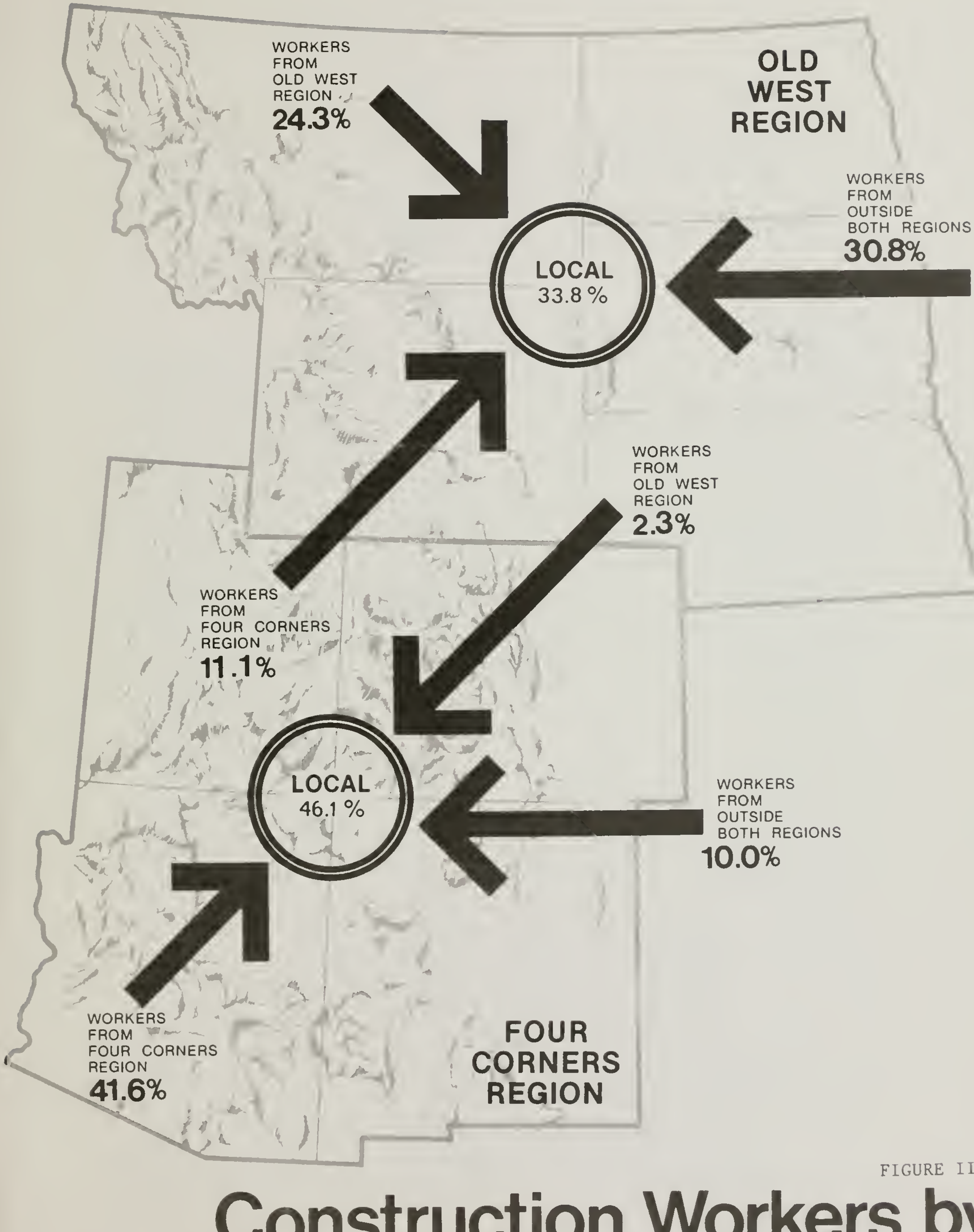
WORKERS FROM OLD WEST REGION 24.3%
OLD WEST REGION
WORKERS FROM OUTSIDE BOTH REGIONS 30.8%
LOCAL 33.8 %
WORKERS FROM OLD WEST REGION 2.3%
WORKERS FROM FOUR CORNERS REGION 11.1%
LOCAL 46.1 %
WORKERS FROM OUTSIDE BOTH REGIONS 10.0%
WORKERS FROM FOUR CORNERS REGION 41.6%
FOUR CORNERS REGION

FIGURE II-3

Construction Workers by Region of Previous Address

TABLE II-4

NON-LOCAL CONSTRUCTION WORKERS BY STATE OF PREVIOUS ADDRESS

Project Number, Name, and State	Montana	Nebraska	North Dakota	South Dakota	Wyoming	Arizona	Colorado	New Mexico	Utah	Other States	Total
1 Coronado 1,2,3, (Arizona)					3	53				7	63
2 Craig 1,2 (Colorado)	1				3	5	108	4	6	28	155
3 Hayden 2 (Colorado			1		8	25	163	12	5	74	288
4 Colstrip 1,2 (Montana)	36	1	2	1	2	4	1		1	37	85
5 Center--Milton R. Young (N.D.)	1		13	4	1					12	31
6 Leland Olds (N.D.)		2	24	8	3		2			59	98
7 San Juan 1 (New Mexico)						4	3	24		14	45
8 Emery (Utah)					1	1	2		51	1	56
9 Huntington 2 (Utah)	1				15	4	2		102	15	138
10 Jim Bridger, 2,3 (Wyoming)	3	1	4	2	80	11	11	1	16	182	311
11 Texaco Lake Expansion (Wyoming)	5			3	46	2	16		1	37	110
12 Sun Oil--Cordero Mine (Wyoming)	2			12	13	4	10		1	30	72
13 Texas Gulf Sulphur (Wyoming)	2	1			16	12	17	10	26	68	152
14 Wyodak (Wyoming)	2	—	1	7	49	1	8	—	4	17	89
TOTAL	53	5	45	37	240	126	343	51	213	580	1693

Given the surprisingly high proportion of workers originating from within the nine state region and the high wages that they receive, the inference can clearly be drawn that per capita regional incomes are substantially above what they would have been in the absence of the construction projects

B. OCCUPATIONAL COMPOSITION OF THE WORK FORCE

The occupational distribution of the surveyed construction workers is given in Table II-5. Although local workers were employed as craftsmen in about the same proportion (.389) as they were of the total work force (.398), the table shows that there are important differences between the two groups within the craftsmen category, and in the distribution among the other occupational groups. Within the craftsmen category, local workers were relatively more heavily represented as carpenters, cement finishers and millwrights, while the converse is true most conspicuously for pipefitters and electricians. The local workers were somewhat underrepresented in the supervisory occupations, but very much more so in the professional technical categories. In the laborer category just the opposite was the case. Although the local workers made up about 40 percent of the work force, they held nearly 57 percent of the laborer jobs.

C. MARITAL STATUS AND HOUSEHOLD SIZE

Throughout the discussion that follows, three definitional points must be kept in mind. First, in the questionnaire, the question on number of children (see Figure II-2) asked only for the number of children younger than 18 years old. The question was asked in this way to get an estimate of the number of children living at "home". The question was not asked directly because "home" could have been a source of confusion for respondents whose families were not with them. Second, the difference between the family size definition used here and the standard census definition must be kept in mind. The variable here will be smaller than it would have been if the census definition had been used, because it does not include related household members other than spouses and children of the head; it does not include children 18 or over who may still be living at home; and it assumes that divorced or widowed construction workers have a family size of one when in fact a few may have custody of their children. More will be said in Chapter V about the likely extent of this bias, but it is not great. Finally, it must be remembered that average family size refers to the average for families of two or more related persons and does not include one person families.

TABLE II-5

OCCUPATIONAL DISTRIBUTION OF CONSTRUCTION WORKERS--ALL PROJECTS

Occupation	Total Work Force	Number of Local Workers	Local Workers as Percentage of Total
Supervisory	222	73	32.9
Professional Technical	181	32	17.7
Craftsmen	1609	626	38.9
Ironworker	246	85	34.6
Cement Finisher	37	19	51.4
Millwright	52	27	51.9
Boilermaker	63	27	42.9
Pipefitter	359	102	28.4
Electrician	347	94	27.1
Painter	42	17	40.5
Carpenter	356	219	61.5
Plumber	6	2	33.3
Mechanic	46	16	34.8
Sheet Metalworker	18	6	33.3
Bricklayer	7	4	57.1
Welder	30	8	26.7
Laborer	427	243	56.9
Operatives	394	159	40.4
Clerical and Other	308	118	38.3
TOTAL	3141	1251	39.8

Table II-6 shows that the local and non-local construction workers had similar family size characteristics except that a larger proportion of the local workers than of the non-local workers was single, and a larger proportion of the non-local workers was married but without children than is the case for the local workers. Table II-7 shows that the local workers had somewhat larger families than did the non-local workers, although both groups had average family sizes larger than the 1970 average for the United States of 3.57 persons per family.[4]

An important difference between local and non-local workers is that many non-local workers did not have their families with them. Table II-8 gives the percentage of married non-local workers whose families were present for each of the 14 projects. The lowest proportion of married non-local workers with families present was for the Emery project in Utah (46.2 percent), while this proportion was found to be highest at the Jim Bridger plant (77.6 percent). The average for all 14 projects was 63.1 percent, and the percentages for most projects were close to the mean.

Although nearly two-thirds of the married non-local workers brought their families with them, their overall impact was diminished by the fact that the percentage of families present varied by size of family. Table II-9 shows that 72 percent of the two person families were present, but that this percentage decreased as family size increased until, for families with four or more children, only about 55 percent were present.

The effects of marital status, family size, and the presence or absence of the family are all considered in Table II-10 in order to show the total population influx associated with 100 non-local construction workers for each of the projects. For ease of comparison, the data from each of the projects were standardized to the common basis of a one hundred worker increment. The results are striking because they show a substantially larger influx of persons than has commonly been supposed. They show that slightly more than half of the workers were alone (51.1 percent) and that this group was fairly evenly divided between single workers and married workers whose families were not present. The proportion of workers

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[4] U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C.: U.S. Government Printing Office, 1973), p. 1-1628.

TABLE II-6

MARITAL STATUS AND NUMBER OF CHILDREN UNDER 18 YEARS OF LOCAL AND NON-LOCAL CONSTRUCTION WORKERS--ALL PROJECTS

	Percentage of Local Workers	Percentage of Non-Local Workers
Single	23.3	18.5
Divorced or widowed	5.9	6.1
Married, no children	16.7	21.5
Married, one child	13.6	15.0
Married, two children	17.3	16.7
Married, three children	10.7	10.0
Married, four children	6.9	7.4
Married, more than four children	5.5	4.6
TOTAL	100.0	100.0

TABLE II-7

AVERAGE FAMILY SIZE OF MARRIED LOCAL AND NON-LOCAL CONSTRUCTION WORKERS--ALL PROJECTS

	Local Workers	Non-Local Workers
Average Family Size	3.970	3.784

TABLE II-8

PERCENTAGE OF MARRIED NON-LOCAL WORKERS WITH FAMILY PRESENT

Project Number and Name	Percentage of Married Non-Local Workers
1 Coronado 1,2,3	65.6
2 Craig 1,2--Yampa Power Plant	57.3
3 Hayden 2	57.8
4 Colstrip 1,2	66.7
5 Center--Milton R. Young	51.9
6 Leland Olds	55.2
7 San Juan 1	66.7
8 Emery	46.2
9 Huntington 2	62.0
10 Jim Bridger 2,3	77.6
11 Texaco Lake Expansion	62.7
12 Sun Oil--Cordero Mine	50.0
13 Texas Gulf Sulphur	54.8
14 Wyodak	75.7
TOTAL ALL PROJECTS	63.1

TABLE II-9

PERCENTAGE OF MARRIED NON-LOCAL WORKERS WITH FAMILY PRESENT BY SIZE OF FAMILY

Size of Family	Percentage of Workers With Families Present
Two person families	72.2
Three person families	69.4
Four person families	65.2
Five person families	69.3
Six person families	54.0
Families of more than six persons	56.9

TABLE II-10

AVERAGE POPULATION INFLUX PER 100 NON-LOCAL CONSTRUCTION WORKERS

Project Number and Name	Worker Single, Widowed, or Divorced	Worker Married, but Family Absent	Family Present			Total Population Influx per 100 Non-Local Construction Workers
			Worker	Spouse	Children	
1 Coronado 1,2,3	8.7	30.4	60.9	60.9	69.6	230.5
2 Craig 1,2--Yampa Power Plant	27.2	30.8	42.0	42.0	57.4	199.4
3 Hayden 2	22.8	31.1	46.2	46.2	64.4	210.7
4 Colstrip 1,2	34.0	24.7	41.2	41.2	94.8	235.9
5 Center--Milton R. Young	25.0	36.1	38.9	38.9	69.4	208.3
6 Leland Olds	17.1	37.1	45.7	45.7	78.1	223.7
7 San Juan 1	21.7	21.7	56.5	56.5	73.9	230.3
8 Emery	13.3	46.7	40.0	40.0	73.3	213.3
9 Huntington 2	10.6	34.8	54.7	54.7	93.8	248.6
10 Jim Bridger 2,3	21.3	14.0	64.7	64.7	123.0	287.7
11 Texaco Lake Expansion	34.2	24.6	41.2	41.2	56.1	197.3
12 Sun Oil -- Cordero Mine	65.3	17.3	17.3	17.3	28.0	145.2
13 Texas Gulf Sulphur	32.9	25.7	41.3	41.3	67.7	208.9
14 Wyodak	21.6	18.2	60.2	60.2	67.0	227.2
TOTAL ALL PROJECTS	24.6	26.5	48.9	48.9	78.9	227.8

(48.9 percent) with their families present averaged 1.6 children per family. The total influx of persons associated with 100 non-local workers, therefore, would include the 100 workers plus 48.9 spouses and 78.9 children for a total direct population increase of 227.8.

While 2.278 persons was the average population increase per non-local worker, it is important to note that there was substantial variation among projects, from a low of 1.452 persons for the Sun Oil, Cordero mine to a high of 2.877 for the Jim Bridger Plant outside of Rock Springs. With the exception of Sun Oil, all of the projects showed population influxes very close to or above 2.0 persons per non-local worker, with ten of the projects in the range from 1.97 to 2.30 persons. The correspondence of the results discussed here with those obtained from the Household Survey is examined in Chapter V.

CHAPTER III

HOUSEHOLD SURVEY: DESCRIPTION OF FINDINGS

I. INTRODUCTION

The Household Survey component of the CONSTRUCTION WORKER PROFILE was designed to determine the characteristics of the populations of communities which are presently being affected by large construction projects, which have been affected by such projects in the recent past, or which are about to be affected by such projects. The Household Survey used an interviewer-administered questionnaire to collect demographic, economic, and attitudinal information from 1432 households in nine western communities.

Five communities that are presently being affected by large construction projects were selected for study--Forsyth and Colstrip, Montana; Center, North Dakota; and Rock Springs and Green River, Wyoming. Langdon, North Dakota, and Conrad, Montana, were both greatly affected by ABM missile site construction forces in the late 1960s and early 1970s and were selected for study as post-impact communities.[1] The two remaining sample communities were Killdeer, North Dakota, and St. George, Utah, both of which anticipate large energy-related construction projects in their vicinity in the near future. The locations of these communities are shown in Figure III-1. Population sizes and the number of survey households for each community are also given in Table III-1. Both geographic and size distribution were considered when these communities were selected. Initially, Wheatland, Wyoming, was also to be included as a pre-impact community, but it was eliminated upon learning that similar work was already under way in that community by the University of Wyoming.

Significant numbers of construction workers had already moved into the currently affected communities, which were affected in varying degrees by the construction near them. Two communities (Center and Colstrip) were located either at or very

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[1] The difference that the particular nature of these projects may have made on the experience of the two communities is discussed in the Conrad and Langdon COMMUNITY REPORTS.

TABLE III-1

HOUSEHOLD SURVEY COMMUNITIES

Community	Population[a]	Number of Surveyed Households
POST-IMPACT:		
Langdon, North Dakota	4,000	92
Conrad, Montana	3,117	87
CURRENTLY AFFECTED:		
Forsyth, Montana	2,700	193
Colstrip, Montana	3,000	148
Center, North Dakota	890	68
Rock Springs, Wyoming	26,000	432
Green River, Wyoming	9,000	254
PRE-IMPACT:		
Killdeer, North Dakota	615	67
St. George, Utah	11,000	91

[a] 1975 estimates made by local officials.

close to the construction sites. The others were from 25 to 45 miles from power plant sites, but were the major towns closest to the construction sites, and were, therefore, the residential choices for many construction worker households.

The currently affected communities were of various sizes and had experienced varying degrees of growth since the construction projects began. Center, whose 1970 population was 617,[2]

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[2] Published Census data were not available for Center. The 1970 population figure was supplied by local officials.

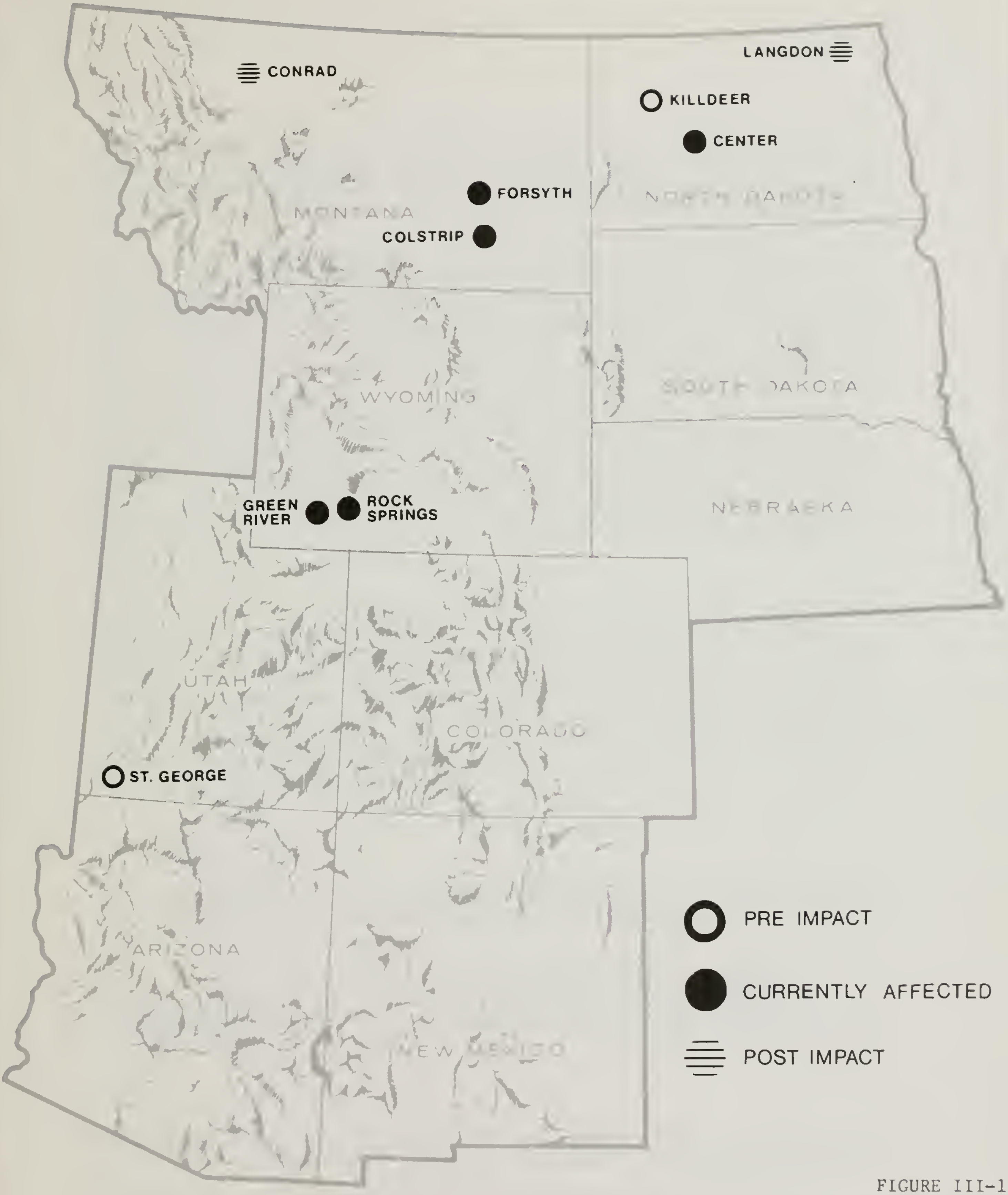

FIGURE III-1

Household Survey Communities

had a population of about 900[3] (45 percent growth) at the time of the Household Survey. Construction of the second unit of the Milton R. Young plant began in 1974, and by 1975, the construction force had increased to about 500 workers.

Rock Springs, the largest of the study communities, had a population of 11,674[4] in 1970, while its 1975 estimated population was 26,000, a 123 percent increase. Green River's 1970 population was 4340,[5] and its estimated 1975 population was about 9000 (107 percent growth). These two communities were affected by construction of the Jim Bridger electrical generating plant and the Texas Gulf Sulphur plant, with peak construction forces of approximately 3000 and 600 workers, respectively. At the time of the Household Survey, there were about 1200 workers at Jim Bridger and 400 at Texas Gulf Sulphur. Construction of the Jim Bridger plant had begun in 1971, and construction at Texas Gulf Sulphur began in 1974. In addition to the impact of the construction of these two plants, the towns grew as a result of the doubling of trona production in the Green River Area.

Forsyth's 1970 population was about 2000,[6] and its 1975 estimated population was close to 3000--a 50 percent increase. Colstrip experienced the most extreme growth, its 1970 population having been only 200 persons[7] and its 1975 population estimated at about 3000. Forsyth and Colstrip were affected by the construction of the Colstrip electrical generating plant. Construction of the plant began in 1972. More detailed information on all of these projects and their work forces can be found in Chapter II.

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[3] All 1975 population estimates discussed here were made by local officials (city planners, city manager, water department officials, etc.).

[4] U.S. Bureau of the Census, 1970 Census of Population: General Social and Economic Characteristics, Wyoming (Washington, D.C.: U.S. Government Printing Office, 1971), p. 52-102.

[5] *Ibid.*, pp. 52-117.

[6] Published census data were not available for Forsyth. The 1970 population figure was supplied by local officials.

[7] Published Census data were not available for Colstrip. The 1970 population estimate was supplied by Western Energy Company employees.

With the exception of Center,[8] the Household Survey was conducted in the currently affected communities using two phase sampling.[9] The first phase consisted of dividing the towns into contiguous clusters of dwellings (of various sizes appropriate to each study community) and conducting an interview with one household from each cluster. This was done in order to determine in what proportions long time residents, newcomer construction workers, and other newcomers actually existed in each community.

Using the data obtained in Phase I to revise the estimates of the size of each subpopulation in the communities, sample quotas for the three population groups were established, and the second phase begun. The towns were again divided into clusters and interviews attempted at one household in each cluster. As quotas were filled, potential respondents were screened according to length of residence and occupation in order to interview the appropriate number of respondents for each group.

The objective of the sampling procedure was to obtain a sample that would enable researchers to be at least 95 percent confident that the estimated characteristics for each group of interest (i.e., long time residents, newcomer construction workers, and other newcomers) differed from the true but unknown values of those characteristics by no more than 20 percent.[10] In total, 1095 interviews were completed in the currently affected communities: 357 with long time resident households, 400 with newcomer construction worker households, and 308 with other newcomer households.[11] This constituted a nine percent sample of the approximately 12,150 households in these communities. Those who had moved to the communities since the construction projects began were considered newcomers, and the distinction between "construction worker" and "other" newcomer households was made on the basis of the household head's occupation.

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[8] Two phase sampling was not used in Center because the town was so small that any sample quotas for newcomer construction workers and other newcomers which might be established to obtain reliable data for those two groups could not be reached. Specifically, there were fewer than 100 newcomer households in Center, and in order to get reliable data on these households as a separate group, a census would have to have been conducted. It was decided, then, that for sampling purposes, the community should be treated like the pre- and post-impact communities and that one systematic sample of the total population be taken. Interviews were conducted with 68 households (a 28 percent sample), 48 of which were long time resident households, 15 of which were newcomer construction worker households, and 5 of which were other newcomer households.

[9] The sampling plan and field procedures are discussed in detail in the USER'S GUIDE TO THE DATA.

At the time when communities for study in the CONSTRUCTION WORKER PROFILE were being selected, Conrad, Montana, and Langdon, North Dakota were the only two communities in the Old West Region which had been the sites of large scale construction projects where the construction period was definitely over, and where the construction boom had been fairly recent. Because of those characteristics, they were chosen as the post-impact communities to be studied to determine what long range effects large construction projects might have on communities. Construction was halted in 1972 at the Conrad site, and in Langdon, the construction ended in 1974.

There was a situation existing for both post-impact communities which might limit the applicability of their experiences to communities affected by large scale energy-related construction projects: they were the sites of federal construction projects, and as such, had access to federal impact funds for meeting the demands made on community facilities by the new populations.

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[10] This objective was accomplished in almost every instance. The reliability of the data is discussed in detail in the USER'S GUIDE TO THE DATA.

[11] The total number of respondents in the three groups was 1065, 30 fewer than the total number of interviews. This is because newcomer respondents occasionally did not answer the question on occupation in a way which made classification by coders into construction or other occupations possible. Their interviews were, however, complete in every other way. So, these questionnaires were included in the analysis of total responses but were not included in either newcomer group, since it could not be determined in which group they belonged.

For sampling purposes, both communities were divided into a number of clusters (92 clusters of 14 households each in Langdon; 87 clusters of 11 households each in Conrad), and an interview was completed with one household from each cluster. A total of 179 interviews was completed in the post-impact communities. This constituted a seven percent sample of households in Langdon and a 9.2 percent sample in Conrad. Researchers can be approximately 95 percent confident that the estimated characteristics for these communities differ from the true characteristics by no more than 20 percent.

Household Survey findings for these two communities are included in this discussion in order to provide some insight into the long-range effects of large-scale construction projects. Tabular presentation of data for these communities will not appear in the text of the FINAL REPORT, but are included in Appendix A for ease of comparison with the currently affected communities.

Killdeer, North Dakota, and St. George, Utah, were included for the Household Survey because they will be affected by the construction of power plants in the not too distant future. The probable impacts of the planned construction will be very different for each community, however. St. George, Utah, will be the site of the construction of an electrical generating plant and a reservoir. St. George presently has a population of about 11,000 and town government appears to be well organized and capable of planning for orderly growth. The residents of the town generally look forward to the construction of the plant and reservoir, and feel that the town will ultimately benefit from its construction.

Killdeer, on the other hand, has a present population of about 600 persons, has minimal town government, and, at this time, has no local planning capability. There are tentative plans for numerous coal gasification plants in the county, and Dunn Center and Killdeer will be the towns bearing most of the population impact. Some population projections for the area are for as many as 50,000 persons if full development occurs.

It is apparent that the situations facing St. George and Killdeer are totally different, both in terms of the scale of future energy development and of the towns' capabilities for dealing with the probable impacts of that development.

The same interview form (included in Appendix B) was used for respondents in St. George and Killdeer. It was assumed that there would be no project-associated newcomers in the pre-impact communities.

The Household Survey was conducted with 91 households in St. George. There were about 2850 households in the town, so it was divided into clusters of approximately 30 households each, and an interview was conducted with one household in each cluster, resulting in a 3.2 percent sample.

The survey was conducted with 67 households in Killdeer. There were about 230 households in the town, so it was divided into clusters of seven households each, and interviews were conducted with two households in each cluster, resulting in a 29 percent sample. In both instances, researchers can be approximately 95 percent confident that the estimated characteristics for these communities differ from the true characteristics by no more than 20 percent.

As stated earlier, the focus of this report is on generalizations which can be made about the five currently affected communities. Information collected in the pre-impact communities does not lend itself to discussion in this chapter except for the data on attitudes of residents toward large-scale energy development. However, all of the information discussed here for the currently affected communities is available for all nine study communities in the COMMUNITY REPORTS for those towns, and, of course, the data are available in all of the forms outlined in the USER'S GUIDE TO THE DATA.

II. RESULTS

A. CHARACTERISTICS OF THE POPULATION OF THE CURRENTLY AFFECTED COMMUNITIES

1. Family Size and Marital Status

Average family size for the residents of the currently affected communities was comparable to that for the states in which they are located and for the United States, with long time resident families somewhat larger than newcomer families. Table III-2 compares family sizes for the residents of the currently affected communities, Montana, North Dakota, Wyoming, and the United States. As the table indicates, all population groups (including newcomer construction workers) had fairly large family sizes, and this finding has important implications for housing demand and for demands on community facilities and services in towns affected by the construction of large energy-related facilities. Newcomers who bring their families (and fairly large ones) to these communities are going to make substantial demands on the entire range of community services. Average family size for the post-impact communities was 3.47, smaller than for any group in the currently affected communities.

TABLE III-2

FAMILY SIZE COMPARISONS--CURRENTLY AFFECTED COMMUNITIES, MONTANA, NORTH DAKOTA, WYOMING, AND THE UNITED STATES[a]

Place	Average Number of Persons Per Family
Currently Affected Communities:	
Long Time Residents	3.77
Newcomer Construction Workers	3.59
Other Newcomers	3.55
Montana	3.62[b]
North Dakota	3.72[b]
Wyoming	3.55[b]
United States:	
Total Population	3.57[b]
Rural Population	3.67[b]

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[a] For the purposes of this report, a family is composed of a head of household and other household members related to the head by blood, marriage, or adoption. Spouses and children were the only relatives of the head included in the data for currently affected communities, but the state and U.S. figures included all household members related to the head. All families included at least two persons.

[b] Source: U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C.: U.S. Government Printing Office, 1973), p. 1-1628.

Small communities faced with the introduction of large-scale economic activity have frequently feared, and rightly so, the possibility of being left with a large financial burden (because of increased taxes) if full preparation, in terms of capital facilities improvements, for projected population increases is accomplished, and the actual population increase turns out to be less than had been projected. Communities have been understandably reluctant to prepare adequately for large construction forces, since it is generally the case that the number of permanent project employees is much smaller than the number of construction employees. The relatively small average family size figure for the post-impact communities indicates a compounding of the problem. If it is true that operating forces themselves are much smaller than construction forces, and, assuming the post-impact communities are representative, if average family size for communities shrinks with the departure of the construction workers, it becomes even less attractive for the communities themselves to provide adequate community facilities for construction boom periods.

TABLE III-3

AVERAGE NUMBER OF CHILDREN IN VARIOUS
AGE CATEGORIES (FOR EACH 100 FAMILIES)
CURRENTLY AFFECTED COMMUNITIES

Age Category	Long Time Residents	Newcomer Construction Workers	Other Newcomers
Under 5	39	56	62
5-11	62	57	55
12-14	28	18	21
15-17	26	17	15
18-19	13	6	4
20-24	8	3	1
25 or over	2	1	0
TOTAL	178	158	158

Nearly 60 percent of all households interviewed in the currently affected communities included children of the household head. Using the family characteristics data obtained in the Household Survey, one could expect the numbers of children shown in Table III-3 in various age categories (for long time residents, newcomer construction workers, and other newcomers) for every 100 families in the currently affected communities. As Table III-3 shows, for long time residents in the currently affected communities, 178 children per 100 families (1.8 children per family) would be expected, and for both newcomer groups, 158 children per 100 families (1.6 children per family) would be expected. In the post-impact communities, age distribution of children living in families was similar to that of the newcomers, especially the newcomer construction workers, in the currently affected communities. In the post-impact communities, for every 100 families, 150 children (1.5 children per family) would be expected.

The newcomer construction worker group included the highest proportion of one person households in the currently affected communities--19 percent, about the same as for the U.S. population.[12] Nearly 15 percent of the other newcomer households consisted of only one person, and 12.1 percent of the long time resident households were one person households. Table III-4 shows the distribution of households by size of household for the currently affected communities and the United States. As the table demonstrates, residents of the currently affected communities tended to live in slightly larger households than average for the United States. Care must be used in the interpretation of the data in Table III-4. The size of household information for the newcomer construction workers is representative of the workers living in the surveyed communities, but, is not necessarily representative of the entire non-local work force associated with a project. Family size data from the Project Survey must be used to make inferences about this group as is done in Chapters II and V.

In the post-impact communities, 13 percent of all households were one person households, and distribution of households by size was similar to that of the long time residents of the currently affected communities. The great majority of household heads in each group in the currently affected communities was married. The group with the greatest proportion of household heads who had never married was the newcomer construction worker group. Table III-5 compares marital status characteristics for long time residents, newcomer construction workers, and other newcomers in the currently affected communities.

Marital status characteristics for residents of the post-impact communities were quite similar to those of long time residents of the currently affected communities: 83.2 percent of the household heads in the post-impact communities were married; 12.8 percent were widowed or divorced; and 3.9 percent had never married.

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[12] U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington, D.C.: U.S. Government Printing Office, 1974), p. 8.

TABLE III-4

HOUSEHOLD DISTRIBUTION BY SIZE OF HOUSEHOLD CURRENTLY AFFECTED COMMUNITIES AND THE UNITED STATES

	Percentage of Households			
	Currently Affected Communities			United States[b]
Size of Household	Long Time Residents	Newcomer Construction Workers	Other Newcomers	
One person	12.1	19.0	14.9	19.1
Two persons	26.7	24.0	20.5	30.8
Three persons	14.3	19.2	25.0	17.1
Four persons	19.7	20.0	23.4	15.6
Five persons	14.3	9.5	9.4	9.3
Six persons	6.7	4.2	3.6	4.4
Seven or more persons	6.1	4.0	3.2	3.8
TOTAL[a]	100.0	100.0	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding.

[b] Source: U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington, D.C.: U.S. Government Printing Office, 1974), p. 14.

TABLE III-5

MARITAL STATUS OF HOUSEHOLD HEADS
CURRENTLY AFFECTED COMMUNITIES

	Percentage of Household Heads		
Marital Status	Long Time Residents	Newcomer Construction Workers	Other Newcomers
Now Married	81.5	76.7	80.2
Widowed or Divorced	14.0	7.2	4.5
Never Married	4.5	16.0	15.3
TOTAL[a]	100.0	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding.

2. Age

Median ages for the three population groups in the currently affected communities were much younger than that for the United States or for the states in which the communities are located. Table III-6 contrasts median ages for Montana, North Dakota, Wyoming, the United States, and the residents of the currently affected communities.

Table III-6 makes it clear that the newcomers to these communities were younger than the long time residents. The median age of the population of the post-impact communities was somewhat older, at 25.32, than for any group in the currently affected communities. The relative youth of the newcomer population is further illustrated in Table III-7 where age distribution of household heads in these communities is presented.

The age distribution of the newcomer household heads in these communities is significant in that 84 percent of them were of the ages generally associated with child bearing and child rearing (under 45). These people are likely to be beginning families and to demand more community services, such as schools, recreation facilities, utilities, and housing. In the post-impact communities, age distribution of household heads was

TABLE III-6

MEDIAN AGE COMPARISONS--CURRENTLY AFFECTED COMMUNITIES, MONTANA, NORTH DAKOTA, WYOMING, AND THE UNITED STATES

Group	Median Age
Currently Affected Communities:	
Long Time Residents	23.69
Newcomer Construction Workers	22.46
Other Newcomers	21.92
Montana	27.00[a]
North Dakota	26.40[a]
Wyoming	27.20[a]
United States	28.10[a]

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[a] Source: U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C.: U.S. Government Printing Office, 1973), p. 1-310.

TABLE III-7

AGE DISTRIBUTION OF HOUSEHOLD HEADS CURRENTLY AFFECTED COMMUNITIES AND THE UNITED STATES

	Percentage of Household Heads			
	Currently Affected Communities			United States[b]
Age Categories	Long Time Residents	Newcomer Construction Workers	Other Newcomers	
14-24	7.0	24.0	19.6	8.4
25-34	23.7	40.6	52.6	20.5
35-44	23.1	15.9	16.7	16.8
45-64	29.9	18.9	10.1	34.5
65 or over	16.3	0.8	1.0	19.9
TOTAL[a]	100.0	100.0	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding.

[b] Source: U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington D.C.: U.S. Government Printing Office, 1974), p. 2.

similar to that for long time residents in the currently affected communities in the youngest and the two oldest age groups, but data for the post-impact communities show an inordinately large proportion of household heads in the 25-34 age category--36.3 percent compared to 23.7 percent for long time residents in the currently affected communities. It may be that the post-impact communities population increase consisted mostly of households with relatively young heads.

Table III-8 compares age distribution of all members of the population groups interviewed in the currently affected communities with that of the U.S. population. This table further demonstrates the youth of the newcomers to the currently affected communities by comparison with the long time residents and the U.S. population.

TABLE III-8

AGE DISTRIBUTION
CURRENTLY AFFECTED COMMUNITIES
AND THE UNITED STATES

	Percentage of Residents			
	Currently Affected Communities			United States[b]
Age Categories	Long Time Residents	Newcomer Construction Workers	Other Newcomers	
Under 15	34.1	33.0	36.7	28.4
15-19	10.4	8.2	7.0	9.4
20-24	6.5	14.8	12.8	8.1
25-34	14.0	23.3	28.8	12.2
35-44	12.6	9.7	9.3	11.4
45-54	7.3	7.5	3.4	11.5
55-64	8.4	2.9	1.2	9.1
65 or over	6.6	0.6	0.6	9.9
TOTAL[a]	100.0	100.0	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding.

[b] Source: U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C.: U.S. Government Printing Office, 1974), p. 1-263.

3. Education

The residents of the currently affected communities were more highly educated than the populations of the states in which the communities are located or the United States as a whole. Responses about educational attainments by long time resident households, newcomer construction worker households, and other newcomer households revealed an interesting pattern. Newcomer construction workers usually finished high school, but rarely became college graduates. In fact, every other group (long time residents, other newcomers, and the populations of the states and of the United States) included more college graduates than did the newcomer construction worker group. The group with the highest educational attainments was the other newcomers group.[13] The proportion of other newcomers who graduated from college was nearly twice that of any other group. Educational attainments for long time residents in the currently affected communities were somewhat higher than those of the populations of the states. More than half the sample of long time residents (51.5 percent) were urban dwellers, and the urban residents of the states included in Table III-9 have significantly higher average educational attainments than the entire populations of those states. This should explain much of the difference. See Table III-9 for comparisons among groups.

The residents of the post-impact communities had educational attainments somewhat higher than those of long time residents in the currently affected communities and somewhat lower than those of the other newcomers. This finding suggests that the newcomers who stay in these communities increase the population's general level of educational attainments. Table III-10, which presents educational attainment data for household heads, further demonstrates the differences among the population groups in the currently affected communities.

The higher educational attainments of other newcomers in the currently affected communities are significant in that, if the other newcomers become permanent residents, the communities

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[13] Other newcomers in Rock Springs, constituting 47.1 percent of the entire other newcomers sample, had considerably higher educational attainments than did members of the same group in the other four currently affected communities, causing educational attainments for the entire other newcomer sample to appear inordinately high.

TABLE III-9

EDUCATIONAL ATTAINMENTS--CURRENTLY AFFECTED COMMUNITIES MONTANA, NORTH DAKOTA, WYOMING, AND THE UNITED STATES

	Percentage of Residents						
	Currently Affected Communities[b]			Montana[c]	North Dakota[c]	Wyoming[c]	United States[c]
Highest Educational Level Completed	Long Time Residents	Newcomer Construction Workers	Other Newcomers				
Less than High School Graduation	27.1	16.6	11.8	40.8	49.7	37.1	47.7
High School Graduate	43.8	45.5	32.4	34.0	27.6	36.2	31.1
Some College	13.7	21.6	28.8	14.1	14.3	14.8	10.6
College Graduate	8.3	6.4	16.3	6.9	5.2	7.2	6.1
Some Graduate School	2.0	1.3	4.0	4.1	3.2	4.6	4.6
Advanced Degree	2.2	0.9	3.6				
Vo-Tech School	2.9	7.7	3.3	---	---	---	---
TOTAL[a]	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding.

[b] Educational attainments for household heads and spouses are included for the currently affected communities. Data for the United States and for the states were reported for persons 25 and over. Because of the method of data analysis for the Household Survey, it was not possible to present data for persons 25 and over only. Some household heads and spouses were under 25, but only six listed their occupations as "student", and so the rest were assumed to have completed their educations. As a result of the procedure of including only heads and spouses in this analysis, some household members over 25 (48 persons) were left out of the educational attainment data for communities presented here.

[c] Source: U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C.: U.S. Government Printing Office, 1973), pp. 1-493,1-494.

TABLE III-10

EDUCATIONAL ATTAINMENTS OF HOUSEHOLD HEADS CURRENTLY AFFECTED COMMUNITIES AND THE UNITED STATES

	Percentage of Household Heads			
	Currently Affected Communities			United States[b]
Highest Educational Level Completed	Long Time Residents	Newcomer Construction Workers	Other Newcomers	
Less than High School Graduation	28.4	13.5	11.0	39.1
High School Graduate	42.7	43.8	29.5	32.7
Some College	12.9	23.0	26.9	13.1
College Graduate	7.9	7.2	19.2	15.1
Some Graduate School	2.2	2.0	4.5	
Advanced Degree	3.4	1.2	5.8	
Vo-Tech School	2.5	9.2	2.9	----
TOTAL[a]	100.0	100.0	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding

[b] Source: U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington, D.C.: U.S. Government Printing Office, 1974), p. 7.

will be left with an increased pool of people with high educational attainments. These people generally are the ones with professional and managerial skills who are essential to a community's ability to cope with problems which might occur, its ability to plan for the future, and even to its ability to provide basic services. This supposition is supported by educational data collected in the post-impact communities mentioned above.

4. Occupation and Industry

Only two percent of the household heads interviewed for the Household Survey in the currently affected communities were unemployed, and six percent were retired. Forty-four percent of all household heads interviewed were construction workers, and three-fourths of these worked on energy-related construction. Table III-11 compares occupations of newcomers and long time residents in the currently affected communities. Table III-12 shows employment by industry of employed household heads in the currently affected communities.

Of all employed construction workers in the currently affected communities (both long time residents and newcomers), 70.8 percent were construction workers before they took their present jobs. Of those workers, 77 percent stayed in the same occupation group (e.g., craftsmen, foremen, and kindred). Of the construction workers who listed non-construction work for previous jobs, 19.6 stayed in the same occupation group, but moved from other industries into the construction industry. The construction occupation category most frequently mentioned as the household head's present job by those who had previously been employed in other industries was "craftsmen, foremen, and kindred" (44.9 percent of those having moved from other industries into the construction industry). The most frequently mentioned previous occupation of those becoming construction workers was "student" (16.7 percent of those changing industries).

When newcomer construction workers were asked why the household head changed jobs, most respondents (93.5 percent) gave job-related answers. Most frequent among other answers was "desire to live in the area" (1.8 percent of all responses).

An interesting difference existed among long time resident, newcomer construction worker, and other newcomer households with respect to labor force participation of secondary workers. In long time resident households, 32.8 percent of the spouses had jobs outside the home, and 12.6 percent of these households included other household members who work. In other newcomer households, 25.3 percent of the spouses had jobs, and 4.9 percent of these households included other workers. Only 12 percent of the newcomer construction worker spouses had jobs, and 9.5 percent of these households included other workers. It appeared to be a characteristic of newcomer construction worker households that there was little labor force participation by secondary workers. This tendency was observed for every currently affected community. It might be that household members other than the head are not encouraged to have jobs outside the home because it would inhibit the transient life style which many members of this group have embraced.

TABLE III-11

OCCUPATION OF HOUSEHOLD HEADS
CURRENTLY AFFECTED COMMUNITIES

	Percentage of Household Heads	
Occupation Category	Long Time Residents	Newcomers
Construction Employment:	22.7	54.2
Professional, Technical, and Kindred	1.7	3.8
Supervisory	3.1	2.6
Craftsmen, Foremen, and Kindred	8.4	32.4
Operatives, except Transport	6.4	4.3
Transport Equipment Operatives	---	1.2
Laborers	3.1	9.9
Non-Construction Employment:	77.4	45.7
Professional, Technical, and Kindred	11.5	11.0
Managerial	11.5	5.6
Sales	2.5	1.5
Craftsmen, Foremen, and Kindred	6.4	5.7
Clerical and Kindred	3.1	1.6
Operatives, except Transport	5.6	4.6
Transport Equipment Operatives	1.4	1.1
Laborers, except Farm	5.0	5.8
Farmers, Farm Managers, Farm Laborers	2.0	0.3
Service Workers, except Private Household	7.6	3.7
Private Household Workers	0.3	---
Retired	17.9	0.4
Unemployed	2.0	2.2
Students	---	0.5
No response	0.6	1.7
TOTAL[a]	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding.

TABLE III-12

INDUSTRY OF EMPLOYED HOUSEHOLD HEADS--CURRENTLY AFFECTED COMMUNITIES[a]

	Percentage of Household Heads	
Industry	Long Time Residents	Newcomers
Agriculture, forestry, fisheries	3.5	1.3
Mining	20.2	16.4
Energy-related construction	17.0	45.2
Non-energy-related construction	8.5	8.6
Manufacturing	4.3	2.3
Transportation, communications, utilities	16.3	12.5
Wholesale trade	----	.3
Retail trade	8.5	3.9
Finance, insurance, real estate	1.8	1.2
Personal services	4.2	1.3
Health and recreation	2.8	.7
Professional and educational services	9.2	5.2
Public administration	3.5	1.1
Other industry	.2	
TOTAL[b]	100.0	100.0

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[a] Retired and unemployed persons were not included for this analysis.

[b] Totals may not add to 100.0 percent because of rounding.

Labor force participation by spouses of household heads in the post-impact communities was about the same, at 35 percent, as for spouses of long time resident household heads in the currently affected communities. Spouses of household heads in the currently affected communities were most often service workers, professional or technical workers, and clerical workers. Table III-13 shows occupations of working spouses, and Table III-14 shows the industries in which these workers were employed.

5. Income

As one would expect, residents of the currently affected communities had higher incomes than residents of the post-impact or pre-impact communities. Median annual incomes for the populations of the pre- and post-impact communities ranged from $7,900 to $13,545[14] in 1975. The median annual income for the United States was $10,512 in 1973.[15] Table III-15 compares median incomes for the population groups in the currently affected communities and the United States, and Table III-16 shows the distribution of population groups among various income categories.

While all groups in the currently affected communities had median incomes higher than those for the U.S. population as a whole, the long time residents had incomes much lower than those of the newcomers, especially the newcomer construction workers. Median income for newcomer construction workers was 27 percent higher than for long time residents. Almost 26 percent of the long time residents had incomes of less than $10,000, compared to 3.6 percent of the newcomer construction workers and

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[14] By far the highest median annual household income for a pre- or post-impact study community was observed for Langdon, North Dakota, a post-impact community. At $13,545, it was comparable to that for long time residents in the currently affected communities. Langdon was the only post-impact community which experienced a significant increase in economic activity and population, and the median household income figure reflects this.

[15] U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington, D.C.: U.S. Government Printing Office, 1974), p. 1.

TABLE III-13

OCCUPATIONS OF WORKING SPOUSES--
CURRENTLY AFFECTED COMMUNITIES

	Percentage of Working Spouses		
Occupation	Long Time Residents	Newcomer Construction Workers	Other Newcomers
Construction Employment:	3.1	14.0	1.6
Professional, technical, and kindred	1.0	----	---
Supervisory	---	5.6	---
Craftsmen, foremen, and kindred	2.1	2.8	1.6
Laborers	---	5.6	---
Non-Construction Employment:	96.8	86.2	98.4
Professional, technical, and kindred	22.9	16.7	32.3
Managerial	4.2	8.3	1.6
Sales	6.3	----	1.6
Craftsmen, foremen, and kindred	---	2.8	---
Clerical and kindred	17.7	30.6	29.0
Operatives, except transport	3.1	----	6.5
Transport equipment operatives	1.0	----	---
Laborers, except farm	2.1	----	4.8
Farmers, farm managers, farm laborers	1.0	----	---
Service workers, except private household	38.5	22.2	19.4
Private household workers	---	----	1.6
Students	---	2.8	1.6
Armed Forces	---	2.8	---
TOTAL[a]	100.0	100.0	100.0

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[a] Totals may not equal 100.0 percent because of rounding

TABLE III-14

INDUSTRY OF EMPLOYED SPOUSES-- CURRENTLY AFFECTED COMMUNITIES

Industry	Percentage of Working Spouses		
	Long Time Residents	Newcomer Construction Workers[b]	Other Newcomers
Agriculture, Forestry, Fisheries	2.1	----	---
Mining	3.1	14.3	6.5
Energy-related Construction	3.1	----	4.8
Nonenergy-related Construction	2.1	8.6	---
Manufacturing	---	2.9	1.6
Transportation, Communications, Utilities	6.2	11.4	8.1
Retail Trade	21.6	17.1	12.9
Finance, Insurance, Real Estate	4.1	5.7	1.6
Personal Services	13.4	11.4	16.1
Health and Recreation	19.6	2.9	19.4
Professional and Educational Services	20.6	17.1	27.4
Public Administration	3.1	2.9	---
Other Industry	1.0	----	---
Students	---	2.9	1.6
Armed Forces	---	2.9	---
TOTAL[a]	100.0	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding.

[b] The percentage of newcomer construction worker spouses shown working in the construction industry here does not agree with the percentage shown in Table III-21. This is probably because some of these spouses were in construction-related jobs for mining companies, and so would have indicated "mining" as the industry in which they worked.

TABLE III-15

MEDIAN HOUSEHOLD INCOME
CURRENTLY AFFECTED COMMUNITIES AND THE UNITED STATES

Group	Median Income[a]
Currently Affected Communities: 1975	
Long Time Residents	$13,913
Newcomer Construction Workers	17,689
Other Newcomers	15,300
United States: 1973	10,512[b]

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[a] Medians were determined for those reporting incomes. Nonresponses were dropped out.

[b] Source: U.S. Bureau of the Census, Consumer Income: *Household Money Income in 1973 and Selected Social and Economic Characteristics of Households* (Washington, D.C.: U.S. Government Printing Office, 1974), p. 1. This is a 1973 figure while the figures for the other groups are for 1975. (The Household Survey was conducted in the summer of 1975). For purposes of rough comparison, if the U.S. figure is adjusted for 10 and 8 percent average inflation in 1974 and 1975 respectively, it would have a value of $12,488. The implicit price deflator for GNP averaged 10.28 percent higher in 1974 than 1973, and for the first three quarters of 1975 averaged 8.05 percent higher than 1974. *U.S. Bureau of Economic Analysis*, *Survey of Current Business*, October, 1975, p. 13.

TABLE III-16

ANNUAL HOUSEHOLD INCOME
CURRENTLY AFFECTED COMMUNITIES AND THE UNITED STATES

	Percentage of Households			
	Currently Affected Communities (1975)			United States[c] (1973)
Income Category	Long Time Residents	Newcomer Construction Workers	Other Newcomers	
Less than $4,000	7.8	0.2	2.5	17.5
$4,000-$5,999	5.9	0.5	2.3	10.4
$6,000-$7,999	4.5	0.2	2.6	9.9
$8,000-$9,999	7.6	2.7	7.8	9.7
$10,000-$11,999	11.2	7.0	10.1	9.7
$12,000-$14,999[a]	12.9	10.7	13.3	12.9
$15,000-$24,999[a]	39.1	57.9	50.9	22.1
$25,000 and over[a]	9.6	19.0	8.6	7.8
No response	1.4	1.2	1.6	----
TOTAL[b]	100.0	100.0	100.0	100.0

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[a] Income data for the Household Survey were collected for $2,000 intervals. These categories do not match published U.S. Census income categories exactly. The $12,000-$14,999 category is a census category which corresponds to the $12,000-$13,999 category in the Household Survey. The $15,000-$24,999 category is a census category which corresponds to five Household Survey categories including incomes between $14,000 and $23,999. The $25,000 and over category is a census category which corresponds to nine Household Survey categories including incomes of $24,000 and over.

[b] Totals may not add to 100.0 percent because of rounding.

[c] Source: U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington, D.C.: U.S. Government Printing Office, 1974), p. 14.

15.2 percent of other newcomers. These are low incomes for communities where the costs of goods and services are reportedly very high.

The higher incomes of newcomers to towns affected by energy development can have important implications for the communities into which they move. The newcomers will bring more disposable income to the community, and some of it will be spent there. The larger the community and the more commercial facilities it has, the greater will be the share of the newcomers' disposable incomes that is retained. Incomes in the community will generally increase as a result, but there can also be some division between newcomers and long time residents as a result of the income differences. Long time residents may resent the affluence of the new residents and thus avoid social contact with them. This can be an important factor in the isolation and alienation newcomers can feel in these communities.

Undoubtedly, however, most long time residents have benefited economically from the coming of the construction projects. Median household income in the United States increased by 23.9 percent from 1969 to 1973,[16] whereas the median household income for long time residents in the currently affected communities[17] increased by anywhere from 58 percent to 80 percent from 1969 to 1975.[18]

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[16] U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C.: U.S. Government Printing Office, 1973), p. 1-957; and Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington, D.C.: U.S. Government Printing Office, 1974), p. 1.

[17] The currently affected communities referred to here are Forsyth, Montana, and Green River and Rock Springs, Wyoming, the only ones for which published Census data are available.

[18] U.S. Bureau of the Census, 1970 Census of Population: General Social and Economic Characteristics, Wyoming (Washington, D.C.: U.S. Government Printing Office, 1971), p. 52-132; and 1970 Census of Population: General Social and Economic Characteristics, Montana (Washington, D.C.: U.S. Government Printing Office, 1971), p. 28-243.

Respondents to the Household Survey were asked about their household expenditures, how much they spent on various goods and services, and how much of their spending was done locally (within their communities). The ratio of total household expenditures and savings to gross income was .72 for long time residents, .74 for newcomer construction workers, and .75 for other newcomers. The income unaccounted for by expenditures was composed of personal income taxes, social security taxes, other payroll deductions not included in expenditures, and any underestimation of expenditures by the respondent. The ratio of local to total expenditures (exclusive of savings) for the long time residents was .59; the ratio for newcomer construction workers was .50; and for other newcomers, the ratio was .61.[19] In other words, residents of the currently affected communities made from half to three-fifths of their expenditures locally. Table III-17 shows average monthly expenditures by category for residents of currently affected communities.

B. RESIDENTS' PLANS FOR STAYING IN AREA

Most newcomers to the currently affected communities (86.3 percent) moved to them for job-related reasons. Over 42 percent said they moved to their communities because of "job opportunities," and another 21 percent said they had been transferred there. Most frequent among non job-related reasons was "proximity to family" (4 percent of all responses).

All respondents were asked what their plans for staying in the area were. Fewer newcomer construction workers than any other group planned to settle down in the area, and more of this group than of any other made their plans contingent on work availability. The other newcomer group expressed uncertainty or planned to stay until transferred more frequently than did the other groups. Table III-18 shows differences in plans for staying among the three groups. Of these three groups, newcomer construction workers appeared to be the most transient: only

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[19] Colstrip residents did very little local spending because of the unavailability of shopping facilities in that town at the time of the survey. The ratio of local to total expenditures for all currently affected communities, and especially for newcomer construction workers, was, therefore, somewhat lower than it would have been if Colstrip had not been included in the sample.

TABLE III-17

AVERAGE HOUSEHOLD EXPENDITURES BY CATEGORY--CURRENTLY AFFECTED COMMUNITIES

Expenditure Category	Long Time Residents		Newcomer Construction Workers		Other Newcomers	
	Average Monthly Expenditures	Average Local Monthly Expenditures	Average Monthly Expenditures	Average Local Monthly Expenditures	Average Monthly Expenditures	Average Local Monthly Expenditures
Housing	$ 99.34	$ 99.34	$ 168.84	$168.84	$190.78	$190.78
Utilities[a]	49.74	-----	45.77	----	41.76	----
Auto payments and service	95.92	60.38	155.68	65.78	120.50	59.98
Insurance and Medical	62.39	11.24	54.73	8.16	51.89	9.65
Groceries	176.78	141.77	180.92	131.62	175.01	150.13
Amusements, travel and other	218.49	109.06	330.19	116.26	284.86	126.47
TOTAL[b]	$737.76	$431.77	$1009.11	$500.81	$895.41	$550.29

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[a] Utilities payments were assumed to be non-local.

[b] Adding figures for the individual expenditure categories will not result in a total figure identical to that shown in the table, because the total shown here is a mean calculated from ungrouped data, and is, therefore, more accurate than a total derived from adding mean expenditures for each category.

TABLE III-18

PLANS FOR STAYING IN THE AREA
RESIDENTS OF CURRENTLY AFFECTED COMMUNITIES

Plans	Percentage of Residents		
	Long Time Residents	Newcomer Construction Workers	Other Newcomers
Settle down here	75.9	10.2	32.1
Leave immediately	1.1	5.2	3.0
Stay as long as work is available	10.2	51.0	12.1
Uncertain	4.2	7.0	13.8
Leave at retirement	4.0	21.5	22.0
Stay until transferred	2.8	2.7	13.4
Other	1.7	2.2	3.6
TOTAL[a]	100.0	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding.

10 percent planned to settle in their communities, 51 percent indicated they would stay only as long as work is available, and 21.5 percent planned to stay until retirement. It is possible that these are construction workers who feel that their communities will continue to have energy-related construction for a period of years, and plan to take advantage of the opportunity to work and be with their families in one place for a while.

The other newcomers show a different pattern. Quite a large proportion (32.1 percent) planned to settle in the area, 22 percent planned to leave at retirement, and 13.4 percent planned to stay until transferred. The fact that a significant proportion planned to stay until transferred fits very well with the fact that this group has the greatest number of professionals. Professionals employed by large companies are frequently transferred as they are promoted within the corporation. These people apparently have more job security than the newcomer construction workers, indicated by the infrequency of their answers in the "stay as long as work is available" category in comparison with the frequency with which construction workers chose that category. Also, construction workers rarely chose the "stay until transferred" category, while it was the third most frequent choice of other newcomers.

The data collected from residents in the pre- and post-impact communities and from long time residents in the currently affected communities show no significant differences in those residents' plans for staying in their communities. Apparently, the presence of large construction projects and the impacts associated with them have little, if any, effect on the decisions of the original residents of these communities about whether to stay or leave. Newcomers, however, indicated little inclination to settle in the areas in which they were living and made their plans for staying or leaving contingent on work availability. This is a pattern to be found among newcomers in all of the currently affected communities studied. Newcomers in these towns seem to be part of a highly mobile group of people whose changes of residence depend on their jobs. It may be that they spend their lives moving from town to town, and never really become integrated into any community. Indications are that many newcomers are quite resilient, frequent changes of residence having become a way of life for them. The possible isolation and alienation of newcomers remains a problem, but it may not be as severe as the anomic situation into which long time residents are plunged when faced with the enormous changes in their way of life that have been brought about by the presence of large construction projects. In Rock Springs, for example, the mental health center's case load has increased greatly,[20] and most of its new cases are long time residents who are having difficulty coping with the drastic changes brought about by the influx of huge numbers of newcomers.

C. COMMUNITY INTEGRATION

A question aimed at finding indicators of the inclusion or isolation of newcomers in the currently affected communities was asked in the Household Survey. Respondents were asked to rank the three places where they met most of their friends in terms of their importance as sources of social contact. All three population groups, long time residents, newcomer construction workers, and other newcomers mentioned "work" more frequently than any other source of social contact.

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[20] The Southwest Counseling Service, Rock Springs' Mental Health Center, reported an 88.5 percent increase in cases since 1970.

When the top three sources of social contact for each group are combined, it can be seen that the two newcomer groups are quite similar to each other in terms of their reliance on various sources of social contact, relying more heavily on work and bars for contact than long time residents. Long time residents showed more dependence on church, clubs, relatives, and school for social contact than did members of either of the newcomer groups. Table III-19 illustrates this.

TABLE III-19

SOURCES OF SOCIAL CONTACT
CURRENTLY AFFECTED COMMUNITIES[a]

Source	Percentage of Residents		
	Long Time Residents	Newcomer Construction Workers	Other Newcomers
Work	61.4	81.0	74.5
Church	36.3	16.9	24.5
Bars	10.5	19.0	12.7
Clubs and Community Activities	27.5	14.9	16.0
Recreation	17.5	21.8	13.4
Relatives	12.0	8.7	9.5
Neighborhood	50.3	52.6	45.1
School	27.5	3.3	6.9
Other	19.6	24.9	20.6

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[a] This table combines responses about the three most important sources of social contact, so percentages add to more than 100.0 percent.

Responses to the question about social contact appeared, from data collected for this study, to vary more according to size of community than according to any other variable, including community status as pre-impact, post-impact, or currently affected. Responses to the question by Killdeer, North Dakota respondents and Center, North Dakota respondents resembled each other fairly closely and these were the only two study communities with populations of less than 1000. Responses by residents of Conrad and Forsyth, Montana and Langdon, North Dakota also resembled each other closely, and these communities have small populations (ranging in size from 2700 people to 4000). Answers to this question by St. George, Utah residents and by Green River, Rock Springs, and Colstrip long time residents differed significantly from those in the smaller communities, one major difference being that respondents in the larger communities and in Colstrip relied more heavily on work for social contact than did residents of the smaller communities. It appears, then, that status as pre-impact, post-impact, or currently affected communities influenced the socializing patterns of residents less than did the size of the community.

D. SATISFACTION WITH SERVICES

Respondents to the Household Survey were asked to indicate how satisfied they were with many community services, including law enforcement, fire protection, utilities, garbage collection, streets and roads, medical services, entertainment, shopping facilities, schools, and housing. The data on respondents' satisfaction with services could be compared with the capital facilities data collected at the time of the Household Survey in order to determine how respondents' perceptions of the adequacy of public facilities accord with an objective evaluation of services and facilities. This provides a measure of the respondent's satisfaction with living in the community. In analyzing responses to these questions for the currently affected communities, it was generally found that long time residents tended to be satisfied with services more frequently than were newcomers. Several reasons for this can be hypothesized. One reason could be that newcomers had lived in other communities recently, and those communities might have been larger or less affected by sudden growth and provided better services. These newcomers might have had high expectations of community services, and in their eyes, their new community would suffer by comparison with their old community. Another reason might be that newcomers can be somewhat excluded by long time residents, and as a result of feeling alienated from the community, can be more critical.

Obviously, levels of satisfaction with services will vary from community to community, depending on the amount of growth and disruption experienced by each community. In fact, it was found that residents of Rock Springs and Colstrip, undoubtedly the communities experiencing the greatest growth and having, as a result, the least adequate services, were the least satisfied with community services.

Averaging responses to the questions on community services for all currently affected communities would not be very revealing, since the perceived adequacy of those services varied greatly from community to community. Data on the responses for each community and on capital facilities are available in the COMMUNITY REPORTS.

However, analysis of responses to these questions according to the education of the household head and according to household income was revealing. Households in which the head had less than a college degree tended to be slightly more satisfied than dissatisfied with services--55.1 percent of the responses made by these households about community services were "very satisfied" or "satisfied", and 44.9 percent were "dissatisfied" or "very dissatisfied".[21] Those households in which the head had a college degree or more education tended to be less satisfied with services--49.9 percent of the responses from these households indicated satisfaction, and 50.1 percent indicated dissatisfaction. Similarly, as household income increased, so did dissatisfaction with services. Respondents from households with incomes of less than $15,000 tended to express more satisfaction with services--59.4 percent indicated satisfaction and 40.6 percent dissatisfaction, while among those with incomes of $15,000 or more, only 51.2 percent expressed satisfaction, and 48.8 percent dissatisfaction.

It is unclear from this analysis whether status as newcomer or long time resident, educational level, and income all influenced responses to these questions, or whether only one or two of these variables influenced responses. The other newcomers had, as a group, the most education, and also showed more dissatisfaction with services than any other group. Also, both newcomer groups had higher incomes than did long time residents, and they were generally less satisfied with services than were the long time residents.

E. HOUSING PREFERENCES

In the currently affected communities, long time residents owned or were buying their homes much more frequently than were newcomers. Table III-20 shows home ownership for the population groups in the currently affected communities.

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[21] "Uncertain" responses were not included for these analyses.

TABLE III-20

HOME OWNERSHIP
CURRENTLY AFFECTED COMMUNITIES

Group	Percentage of Households Own	 Rent	 Total
Long Time Residents	79.4	20.6	100.0
Newcomer Construction Workers	50.4	49.6	100.0
Other Newcomers	46.7	53.3	100.0

Table III-21 shows distribution of households among various housing types. More newcomer construction workers than any other group lived in mobile homes and fewer of them lived in single family houses. Only 19 percent of the newcomer construction workers lived in single family housing, compared with 43.7 percent of the other newcomer households and 76 percent of the long time resident households.

TABLE III-21

TYPE OF DWELLING CURRENTLY AFFECTED COMMUNITIES

Dwelling Type	Percentage of Households Long Time Residents	 Newcomer Construction Workers	 Other Newcomers
Single Family:			
Two bedrooms	24.5	5.5	10.2
Three bedrooms	31.6	7.3	20.7
Four bedrooms	12.3	2.0	6.9
Five bedrooms	2.8	0.3	1.6
Other	4.8	4.0	4.3
Duplex, Townhouse, Condominium	1.1	1.8	4.9
Apartment	4.3	10.1	16.1
Mobile Home	17.7	53.4	31.9
Other	0.9	15.6	3.3
TOTAL[a]	100.0	100.0	100.0

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[a] Totals may not add to 100.0 percent because of rounding.

It is apparent that newcomers and long time residents were quite different with respect to the type of housing in which they lived. Much of this can be explained by the fact that housing construction lagged behind population growth, and mobile homes were virtually the only housing choice available to newcomers as rental housing in these communities was quickly filled. The most interesting difference shown in the table, however, is that between newcomer construction workers and other newcomers, the proportion of newcomer construction worker households living in mobile homes was more than one and one-half times that of other newcomer households. So, it must be assumed that newcomer construction workers chose to live in mobile homes more frequently than did other groups. This question is discussed in more detail in Chapter V.

In the post-impact communities, the distribution of households among housing types was more similar to that of the long time residents than of any other group in the currently affected communities. However, some impact on housing in those communities has apparently occurred, since 21.6 percent of the households lived in mobile homes, a greater proportion than that shown for long time residents in the currently affected communities. Also, a smaller proportion of households in the post-impact communities than of long time resident households (63.6 percent of all households) lived in single family dwellings, and a greater proportion (11.9 percent) lived in apartments.

In the currently affected communities, the two newcomer groups indicated similar levels of dissatisfaction with their present dwellings--39.2 percent of the newcomer construction workers said a different type of housing would be preferable to their present dwelling, and 38.9 percent of the other newcomers did so. Of all dissatisfied respondents, 47 percent were mobile home dwellers.

When asked why they were not living in the preferred housing type, dissatisfied respondents most frequently (42.7 percent of all responses) said it was too expensive or that it was unavailable (39.2 percent of responses). Only 3.2 percent said that "temporary job" was the reason.

F. ATTITUDES OF LONG TIME RESIDENTS ABOUT EFFECTS OF PROJECTS

Long time residents in the currently affected communities were asked a few questions concerning the effects they felt the construction projects in the area were having on the community and its residents. When asked whether the effects of the construction were the same, better, or worse than they had originally expected, only 14.5 percent of the respondents answered "better", 32.8 percent said the effects were "worse" than expected, and 52.4 percent felt the effects were about what they had expected. There was a tendency for those who had lived in the currently affected communities for fifteen years or longer to answer "worse" more frequently than other respondents. Nearly 40 percent of these respondents thought the effects were worse, whereas only 22.8 percent of the others thought so. There was a less pronounced tendency for higher income respondents to think project effects were worse--35 percent of those with annual household incomes of $15,000 or more thought effects were worse than expected, while 30.7 percent of those with lower incomes thought so.

The reasons given most frequently for thinking the effects were better than expected were, "improved community facilities" (40 percent of those thinking the effects were better), and "financial benefits" (35 percent). The reasons given most frequently for thinking the effects were worse than expected were, "inadequate community facilities" (63 percent of those thinking the effects were worse), and "increased population" (22 percent).

In the post-impact communities, respondents were also asked whether they felt the effects of the construction projects were the same, better, or worse than they had expected. About the same proportion of the post-impact community residents as of long time residents of the currently affected communities (51.3 percent compared to 52.4 percent) felt that the effects had been about what they had expected, but the proportions thinking the effects were better (or worse) varied between the two types of communities. In the post-impact communities, opinions were fairly evenly divided between thinking the effects were better and thinking they were worse. Over 25 percent of those residents thought the effects were worse than expected, compared to 32.8 percent of the long time residents in the currently affected communities; whereas 23.5 percent of the residents of the post-impact communities felt the effects were better than anticipated, compared to 14.5 percent for the currently affected communities. It is possible that residents of the currently affected communities were more negative about the effects of the project(s) because they were still experiencing severe negative impacts, while the period of severe impacts was over in the post-impact communities. Reasons given by residents of post-impact communities for thinking effects were better or worse than expected were almost identical to those given by long time residents of currently affected communities. In the post-impact communities, those who said the actual effects were better than they had expected mentioned improved community facilities as a reason most frequently (44.4 percent of the respondents feeling the effects were better than expected).

The next most frequently mentioned reason was "financial benefits" (14.8 percent of those respondents). Most frequently given as reasons for feeling the effects of the projects were worse than expected were "inadequate community facilities" (38 percent of those thinking the effects were worse), and "increased cost of living" (31 percent of those respondents).

When asked whether they were glad or unhappy that the projects were in the area at all, most long time residents of the currently affected communities (67 percent) said they were glad. Respondents who had lived in the area fifteen years or more were more frequently unhappy about the projects than those who had lived there for less time. Forty percent of those living for fifteen years or more in the area were unhappy, whereas only 21.6 percent of the others were. There was also a tendency for those with higher incomes to be glad more frequently than those with lower incomes. Seventy-one percent of those with annual household incomes of $15,000 or more were glad of the presence of the projects, and 64.7 percent of those with lower incomes were glad. This is entirely reasonable, since higher income people are the ones most likely to have benefitted economically from a boom. The reasons given most frequently for being glad the projects came to the area were, "job opportunities" (37.6 percent of the respondents who were glad) and, "financial benefits" (26.5 percent).

Nearly 32 percent of all respondents were unhappy the projects had come to the area. The reasons given most frequently for this were, "caused town problems" (28 percent of the respondents who were unhappy about the projects), "increased population" (27 percent), "inadequate community facilities" (27 percent), and "arrival of undesirable people" (26 percent).[22]

G. EXPECTATIONS OF RESIDENTS OF THE PRE-IMPACT COMMUNITIES ABOUT THE EFFECTS OF THE PROPOSED PROJECT(S)

Respondents in the pre-impact communities were asked whether they expected their communities to change with the coming of the projects proposed for their areas, and if so, in what ways. In Killdeer, nearly all respondents (95.5 percent) expected the community to change. When asked in what ways they expected the community to change, respondents gave a wide variety of answers, most of which could be classified as positive or negative. Those answers for which a positive or negative value could not be readily assigned were given a neutral classification. Eighty-two percent of the respondents to this question gave at least one negative response, most of which had to do with expected inadequacies in community facilities and housing supply. The most frequently given negative response was "crowded schools" mentioned by 21.6 percent of the respondents. Fifty percent of the respondents gave at least one positive answer to this question, most of them dealing with expected increases in the adequacy of community facilities and housing supply. The most frequently given positive response was "increased housing supply", given by 20 percent of the respondents. Another 40 percent of the respondents gave neutral answers to this question.[23] Most of these responses dealt with increased population and growth. The most frequently given neutral response was "increase in population" (31.6 percent of respondents). No significant differences in types of responses were observed for various age and income groups.

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[22] Respondents were encouraged to give more than one response about why they were glad or unhappy about the projects, so percentages may add to more than 100.

In St. George, too, nearly all respondents (96 percent) expected the community to change. When asked in what ways they expected the community to change, 84 percent of the respondents gave at least one neutral response, most of which had to do with population growth. The most frequently given single neutral response was "increase in population" mentioned by 41.2 percent of the respondents. Forty percent of the respondents gave at least one positive answer to this question, most of them dealing with expected increases in the adequacy of community facilities and services and the housing supply. The most frequently given positive response was "increase in commercial services", given by 14 percent of the respondents. Another 15 percent of the respondents gave one or more negative answers to this question.[24] Most of these responses dealt with air pollution and expected inadequacies in community facilities. The most frequently given negative response was "air pollution" (8.2 percent of respondents). No significant differences in types of responses were observed for various age, income, and educational attainment groups in St. George.

In talking about the expected effects of the projects, residents of the pre-impact communities mentioned many of the same things which residents of the currently affected and post-impact communities mentioned as actual construction period effects.

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[23] Respondents were encouraged to mention more than one expectation of change, so percentages add to more than 100.0 percent.

[24] Ibid.

Residents of pre-impact communities were asked whether they felt the effects of the expected projects would be good or bad for the community. In Killdeer, 41.8 percent of the respondents felt that the effects would be good, 50.7 percent felt the effects would be bad and 7.5 percent gave no opinion. No significant differences were noted when these responses were analyzed according to age and education of household head and according to household income. Respondents were also asked their reasons for thinking the projects' effects would be good or bad. Of those who felt the effects would be good, 39 percent gave improved community services as the reason, 21 percent mentioned financial benefits, and another 21 percent mentioned increased job opportunities. Of those respondents who felt the effects of the proposed projects would be bad, 21 percent mentioned environmental problems, and 21 percent felt that their life style would be lost.

In St. George, 63.7 percent of the respondents felt that the effects would be good, 15.4 percent felt the effects would be bad, and 20.9 percent gave no opinion. These responses were analyzed according to age and education of household head and according to household income, and no significant differences were noted. Respondents were also asked their reasons for thinking the projects' effects would be good or bad. Of those who felt the effects would be good, 34 percent gave increased job opportunities as the reason, and 22 percent mentioned financial benefits. Of those respondents who felt the effects of the proposed projects would be bad, 36 percent mentioned air pollution, and 28.5 percent mentioned community growth.

St. George residents obviously felt differently than Killdeer residents did about the energy development which will be occurring in their area. The majority of Killdeer residents felt that the development of the proposed gasification plants in the area would be bad for the town. This is understandable, since Killdeer is so small, and very small communities are usually ill prepared to deal with growth of such magnitude that their populations would be multiplied many times over. Small communities rarely have the financial and professional resources necessary to maintain orderly community growth in the face of immense industrial development. Most St. George residents, on the other hand, appeared to be looking forward to the development of the Warner Valley power plant. St. George's population was about 11,000 people (compared with 615 for Killdeer), and town leadership appeared to be well organized and ready to deal with the effects of growth. St. George's population was well educated and probably included a sufficient proportion of persons with professional, technical, and managerial abilities to be able to deal effectively with rapid growth.

It appears, then, that the residents of the pre-impact communities have fairly realistic expectations regarding the effects of the projects proposed for their areas. However, the response to the prospect of growth has been quite different in each community. St. George appears to be well prepared for the growth it faces, whereas Killdeer, although its residents are seemingly aware of the difficulties facing them should projected population increases actually occur, is, at the time of this report, doing very little to either prepare for growth or to prevent it.

H. ATTITUDES OF NEWCOMERS ABOUT LIVING IN THE CURRENTLY AFFECTED COMMUNITIES

Most newcomers to the currently affected communities came there for work-associated reasons, (i.e., job opportunities, job transfer, etc.). Over 86 percent of the newcomers originally moved to these communities for those reasons. All newcomers were given a list of 18 descriptive words (for complete list, see Household Survey questionnaire in Appendix B) and asked to select the two or three words which they felt best described their community. Some of the words were descriptive in a positive way, some were negative and some were neutral.

Negative words (lonely, dull, unfriendly, isolated, difficult, expensive, and dirty) were chosen 52.9 percent of the time. Positive words (easy, happy, modern, exciting, rewarding, friendly, and relaxed) were chosen 32.9 percent of the time, and neutral words (competitive, impersonal, conservative, and slow-moving) were chosen 14.2 percent of the time.[25] Obviously, there can be some argument about the classification of these words into positive, negative, and neutral. For instance, "isolated" could be considered quite positive by some people, and "impersonal" might be considered negative rather than neutral. An attempt was made to attach the value that most respondents seemed to attach to these words.

The most frequently mentioned descriptive words were "expensive" (16.2 percent of all responses), "friendly" (14.5 percent of all responses), and "dirty" (10.8 percent of all responses).

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[25] Respondents' first two choices were included for analysis. So there was a total of 1366 answers to this question, with 689 persons responding.

Respondents were also asked to name the things they liked most about living in their communities. The categories of answers which were mentioned most frequently were job-related factors (22 percent of all responses), friendly people (18.5 percent), recreation opportunities (13.2 percent), and rural atmosphere (11 percent).

When asked what they liked least about living in the currently affected communities, respondents most frequently gave answers concerning the environment and physical surroundings (29.2 percent of all responses), inadequate community facilities (26.4 percent), and lack of recreation and entertainment facilities (12.8 percent).

CHAPTER IV

COMMUNITY SURVEY: DESCRIPTION OF FINDINGS

The Project and Household Surveys are a carefully designed set of questions about construction projects and the characteristics of their associated work forces. Other questions about the effects of energy development on individuals and on the institutional and social structures of their communities, however, can be asked. These require that an attempt be made to address the cumulative consequences of the many different changes occurring in the lives of community residents. In general, these questions are more difficult to answer than the questions dealt with in the previous chapters. As a consequence, theoretical models to deal with these phenomena are so abstract as to be of little practical use, and the relevant empirical literature is more a collection of case studies than a generalized set of hypotheses and quantified relationships that would help assess the social effects of rapid growth on individuals and groups.

Although the complexity and difficulty of the task were apparent, it was felt that these questions were sufficiently important that a modest effort be made in each of three communities to assess the personal and social consequences of construction activity. Center and Langdon, North Dakota, and Rock Springs, Wyoming, were the communities included in this section of the study.

Ethnographic methods of direct and participant observation were utilized by field researchers. Each researcher lived in one of the communities for about 2 weeks, and, in the course of living there, used community facilities, met residents, and conducted informal interviews. Use was made of available written materials from the community, including institutional records (e.g., arrest reports, welfare caseloads, city budgets, etc.), daily newspapers, telephone directories, and Chamber of Commerce or other promotional material. Secondary resources, primarily U.S. Census information, previous research reports, planning documents, and other governmental documents, were also helpful.[1]

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[1] A pre-test of both methods and instruments was conducted in Green River, Wyoming, and some observations from the pre-test are included below.

The people living in the impact communities from whom information was sought included newcomers to the community, long time residents, and institutional representatives (i.e., persons in positions of responsibility in government, education, social services, business, religion, and recreation). These individuals were questioned with respect to social changes (i.e., changes in the forms and patterns of social life) and cultural changes (i.e., changes in the content of social life--the beliefs, norms, and values of the community). The methods used to obtain information combined the loose structure of ethnography with the more rigid structure of traditional survey techniques appropriate to the complexity of the phenomena being investigated. Without consistent use of structured questionnaires and interviews, it was felt that little more could be gained than the researchers' impressions of what was happening to the community and its residents.

The three communities of Center, Langdon, and Rock Springs, taken in that order, show an easily discernible progression: each is larger than the last (estimated populations 900,4,000, and 26,000, respectively), each is more significant in its region than the last, each is more tied into the larger world than the last, and each is more institutionally developed than the last. These differences are especially interesting in that they all relate to one another. For instance, the larger the community, the more likely it is to play a key role in its region; the greater its regional importance; the more likely it is to be tied into the outside world; etc.

The objective characteristics of the impacting projects (public/private, kind of activity, scale, labor needs, numbers of newcomers, kinds of newcomers, timing, and project entry) and the community variables (size, institutional development level, location, prosperity, and stature) are described for each community investigated in the appropriate COMMUNITY REPORT. What follows here are some tentative generalizations about the ways in which these characteristics have interacted to produce effects on the individuals and the institutions of the three communities.

I. INSTITUTIONAL IMPACTS/CHANGES

A. GOVERNMENT/POLITICS

The most visible impacts made upon local governmental institutions had to do with the need to provide basic municipal services to an expanding population. These services included police and fire protection, street and road construction and maintenance, water supply, waste water and sewage systems, etc. Each community's government experienced strain, but most were coping with these expanded responsibilities through combinations of local efforts and outside financial assistance. Generally, this impact required an expanded level of effort associated with an existing activity. Less visible, and perhaps more difficult to assess in the long run, were those impacts upon local government where the local unit is called upon to do something it has not done before, such as planning and zoning, conducting new and complicated intergovernmental relations or government-industry relations, devising new taxation schemes, or seeking federal and state funds.

One aspect of the local government's ability to respond is its skill in obtaining outside financial assistance, and this varied greatly among the study communities. Langdon had the advantage of federal impact funds, and its leaders were able to organize themselves effectively enough to obtain them. However, they also had the invaluable assistance of a facilitator from the Cooperative Extension Service. In Center, these skills were unavailable, and only recently has the area been able to acquire staff able to handle such tasks. Each community took steps to generate revenues on its own as well: in Rock Springs, a sales tax was passed, the mill levy was raised in Langdon, and special assessments were levied in Center.

In each community, the impact industry also played some role in increasing the local government's response capability. In Center, the Minnkota company built housing and made monetary and informational contributions; in Rock Springs, the mining and energy companies time and again gave financial help, and they also built thousands of units of housing. Though the details of industry-town relations are now known, it appears that Rock Springs was most successful in obtaining cooperation and assistance from the impact industries.

In short, the ability to get financial assistance from either impacting industry or regional or federal government seems to be a sophisticated skill which smaller towns have not heretofore needed, and which, therefore, no one in the local governments has had to learn. It appears that the larger the town (and the more important it is in its region), the more able will be its elected and appointed officials in dealing with government and big business. It should be noted that, at the time of this report, the need for regional coordination of governmental response to the needs of communities affected by energy development has been recognized, and efforts are under way to provide for such coordination.

B. THE LOCAL ECONOMY

Positive and negative economic impacts seemed to be the same from one community to another. On the plus side was the creation of a wave of prosperity which took several forms: more business for local businesspeople or incoming entrepreneurs, more jobs for local people and newcomers, and higher pay as a result of competition for workers. On the negative side were increases in the cost of living, especially for the scarcest commodity, housing; the need to update established businesses; and the inequities due to unequal participation in the period of prosperity.

These items deserve some elaboration. New business opportunities were definitely available for those who wished to take the initiative and start something new or expand present facilities. For instance, even in 1974, after the peak of the Rock Springs boom, two dozen new businesses were started; 27 new businesses were started during Langdon's peak years. So far, Center has seen only a few new businesses. Again, the initial size of the community seems important: Rock Springs was a business center before the boom and more new businesses are opening. Center was too small to provide many goods or services, and the new residents still go elsewhere for those things.

From one point of view, the boom period was definitely a period of opportunity; from another point of view, it was a period of challenge, and not everyone was able to meet the challenge. For instance, in Center, it is unlikely that most of the present businesspeople would be able to make the shift should business start to increase, and expansion become necessary. For some older businesspeople in Green River, the job of updating and adopting more modern advertising, merchandising, and financial arrangements was more than they could manage. Some just quit and left, some sold to younger people, some joined a chain operation. Although this kind of turnover is inevitable in any community as one generation ages, the pressure for change during a boom increases to such a degree that people were forced out of their present roles at an accelerated rate.

The job market in each study community has burgeoned relative to the pre-boom period. This means that local people need not leave the area to find work, that some natives can return, and that new people coming into town at the right time can usually find work. The sudden availability of good paying jobs has consequences elsewhere in the local economic order: competition for workers sets in as the low paid store clerk realizes he can make more money in construction or mining, and the public servant finds that the private sector pays more. In addition, the increased cash flow in the community tends to set off an inflationary spiral, and costs can start climbing. The higher cost of living seemed to be one of the few unanimous comments from respondents in the study communities, although it is difficult to know if it was any more rapid in the study communities than in the rest of the United States. Even though the higher wages may offset the increased cost of living for those who are able to participate in the economic boom, there is always a sector of the community that suffers disproportionately from the boom situation (e.g., the elderly and other persons on fixed incomes).

C. EDUCATION

School systems in boom towns are immediately affected by the population influx. If the school system is not physically ready to accept more students, overcrowding occurs. Not only must the physical plant be expanded, new teachers must be hired, new books purchased, etc. This places heavy financial burdens on the system, and therefore, on property owners.

A second kind of problem faced by school officials is the information lag. Some other institutions of the community can get by without precise information about the incoming population, but the school system needs to know enrollments beforehand. This information was rarely available in the study communities. Officials were continually surprised at the numbers of students who showed up on the first day of school. To complicate matters even more, the transiency of a portion of the student body hurts the learning process for all students, particularly for the nomadic students themselves.

On the positive side, the new students and their parents bring a breadth of experience and exposure into the community not otherwise possible; this was most obvious in Langdon, where the curriculum has been significantly updated and expanded. In Langdon, also, the influx of students was eventually followed by an influx of federal monies. But that particular school system may now be facing the problems associated with cutting back after the boom has peaked and the community experiences post-departure impact.

D. SOCIAL SERVICES

The impacts on social service institutions in each community were testimony to the detrimental effects rapid growth has on some people's lives. As was the case with governmental institutions, the problems of social service institutions were of two sorts: the problems of numbers and problems of kind. Not only were there more people to provide with social services, medical and dental care, and mental health care, but the nature of their problems was different from that with which small town agencies are accustomed to deal. In small towns like Center and Langdon, personnel are not readily available to deal with marital counseling, child abuse prevention, or juvenile problems.

Another universal problem in affected communities (as well as in other small towns) is that of attracting and keeping medical personnel. All three towns have experienced this problem, and none has yet managed to solve it, despite large expenditures and community-wide efforts.

II. COMMUNITY IMPACTS/CHANGES

An important aspect of the basic changes occurring in impact communities has to do with changes in roles that people play within their community institutions. In Green River, this process was most pronounced, but signs of it are present in lesser degrees in the other communities. The rapid influx of different kinds of new people in a boom situation causes the whole structure of the community to adjust, and people switch roles in various ways. The switching can take several forms: (1) new roles are created; (2) more positions within existing roles are created; (3) old roles get redefined in light of changing needs; and (4) newcomers replace oldtimers in existing roles.

New roles created. The study communities offered a number of examples of this kind of social structural change. Most common was the creation of new roles in the local economic order, as businesspeople started businesses not previously present in that community. In Green River, there are a number of these, from a new pizza parlor to a new taxicab business. In Rock Springs, a number of new social service positions were created to cope with the growing number of personal and family problems. New local governmental positions were also created (e.g., the position of city planner). Center is getting a dentist and there had not been one in the town before.

Positions are created within existing roles. More people are hired in the study communities to increase employment in occupations already existing in the community. For example, a new waitress is hired as business picks up; more teachers are hired as enrollment figures rise; more neighbors are created as newcomers move in. All of these are multiplications within existing roles.

Old roles are redefined. As institutional responsibilities change with the arrival of the boom, old roles get redefined. A merchant's role is changed as he or she is forced to update merchandising, advertising, or financing. Social workers suddenly find they are dealing with some kinds of problems they never encountered before. A person serving in a formerly one-person job finds he must direct a staff of five. A mayor finds he now has to negotiate with an impact industry, or write a grant proposal to Washington, D.C. All these represent changes in existing roles, and in a number of cases, the changes were such that former role occupants could not or would not make the change, and vacated the role.

Newcomers replace oldtimers in existing roles. In some of the communities, there were cases of oldtimers being unable or unwilling to keep up with the changes demanded of them. Very often a newcomer to the community took over the role. This happened any number of times with businesses, and in several instances, it occurred with leadership roles in the local government structure: a veteran chief of police was replaced by a chief from a larger city with more professional expertise; long-standing county commissioners were replaced by younger, or in some cases new members of the community.

III. CULTURAL CHANGES

Long time residents in the study communities indicated by their responses to the survey adjective check lists that certain cultural changes were occurring--changes in basic beliefs, norms, and values that shape social life. The comparison of adjectives used to describe the community then (pre-boom) and now (during or post-boom) are particularly revealing. Combining the responses for Rock Springs, Langdon, and Center, the communities were seen as less relaxed, friendly, traditional, isolated, harmonious, and run down; and more expensive, difficult, progressive, and competitive.

These changes translate into various sociological categories indicative of important cultural changes. First, the communities are becoming more diverse culturally as new people bring in new ideas (e.g., the expanded curriculum in Langdon's schools, the new recreational demands everywhere, the multiplication of religious denominations in Rock Springs). Second, that diversity means that communities are becoming less provincial and isolated. As the responsibilities of community institutions grew, more people were brought in to run these institutions (e.g., a new police chief, new social service workers, more professional businesspeople); this represents a third trend toward professionalism and respect for expertise. In Rock Springs, the city government was reorganized into new departments, suggesting a fourth pattern of specialization and bureaucratization. Also implicit in such institutional growth is a fifth trend, namely, a growing belief that bigger is better, as well as more efficient and cheaper. This kind of value shift is also revealed in the growing number of chain operations in each community. As opportunities for profit become greater, the workings of the profit motive become more visible, a sixth change in the local culture. People in Green River, in particular, complained about their neighbors chasing the almighty dollar, or increasing prices to whatever the market would bear. As institutions of the community grow, and as neighborly links weaken with more people in town, most of whom are strangers to each other, many people start to rely more on institutions, a seventh cultural shift. The social worker in Center noted that family problems, formerly dealt with among neighbors, are now brought to her. At the same time, the residents become more demanding of those institutions, an eighth change. For instance, the lack of medical care has been a fact for a long time in Center, but only now are residents coming to demand such care. All these changes add up to the evolutionary process of urbanization.

IV. PERSONAL IMPACTS/CHANGES

When the community institutions in which people live out their lives and the culture that those institutions express both change, the people acting out those institutional roles and living in that culture will change as well. The nature of social life is such that these units--persons, institutions, and culture--are intricately bound up with one another, are a system, and when one component changes, other components must change as well.

Among long time residents, the cultural and social changes take a certain toll, as a way of life is seen slipping away or perhaps disappearing, but the severity of the impact on persons varied from one study community to another. There is at the very least a nostalgic yearning for the way of life of yesterday, although in Center and Langdon the changes have not been so drastic that the responses are pathological. In Rock Springs, there are some pathological responses: the mental health clinic shows an eightfold increase in caseload over five years ago, and its director says much of that increase is from long time residents. Many of the long time residents realized that the changes due to urbanization were coming their way eventually, but that does little to make the changes more palatable. Among long time residents, at least four modes of responding to the changes in their communities have been observed.

Make the change. For the largest number of people, taking the changes in stride has been the response. The overworked social worker in Center accepts the larger caseload and works harder. The police chief in Green River starts keeping better records, sends his employees to in-service training, and in general updates the department. The shopowner realizes that he/she should remodel the shop if he/she wishes to attract the expanded market. The long time resident goes next door and welcomes the newcomer to the community.

Maintain the status quo. Some impact community residents seem to be taking the approach of doing things as they always have, while also mourning the passing of a way of life (which may or may not have been romanticized). If these people are in business, they have not expanded or remodeled, if in government, they have not held more meetings or hired more staff. Such persons are the ones most likely to find themselves relieved of their roles by newcomers or other people more willing to make adjustments to the new demands.

Deny the changes. Though this is increasingly hard to do in the study communities, some continue to pretend that nothing is happening. Perhaps they fear they cannot make the changes, or perhaps they simply refuse to, or perhaps they feel things will blow over and return to normal. Some residents of Center, for example, felt that their leaders tried to avoid dealing with the new problems for as long as they could get away with it.

Leave the situation. Flight has always been one of the options persons have open to them in uncomfortable situations. Flight from the bad situation can take the form of leaving the role that is changing (e.g., sell the store, resign from public office), or it can take a more extreme form of leaving the community entirely. Although only one of the respondents to the individual interviews said he was about to leave, it is likely that others have already taken this step.

For newcomers, the reaction to living in a boom town is based, not on what the town used to be before the boom, but what the town they came from was like. Their reactions are also based on their reasons for moving to the new community. For example, a family fleeing the pace of a big city to the small town life may be extremely happy; they may be nearly oblivious to the urbanization of the town and may see any lack of facilities or goods as a minor inconvenience more than compensated for by cleanliness, neighborliness, and space. Another family moving from a big city only because the company transferred them may hate the town and may feel the lack of goods and services to be a constant irritant. Finding themselves strangers in a place where large numbers of people know each other may increase their feelings of loneliness. Those who move to towns as large as Rock Springs from smaller towns may find the pace in Rock Springs too fast, the culture too urban. Theoretically, some newcomers from smaller towns would be pleased with the change, although that response was not encountered.

While long time residents who are unhappy blame the boom (or occasionally the newcomers or some "element" among the newcomers), the newcomers blame the town itself. Thus, those newcomers who are unhappy tend to isolate themselves from the town, from its organizations, groups, politics, etc. This is particularly easy since the newcomers have other newcomers with whom to socialize. The extreme of this behavior can be seen in those newcomers who know they will be leaving soon, and who socialize almost exclusively with others who work for their company, who will also leave soon. In fact, trailer courts, apartments and some subdivisions, particularly in Rock Springs and Green River, were newcomer ghettos. Newcomers who like the town are much more likely to cross the old/new barrier and participate in the social life of the community.

V. PHYSICAL IMPACTS/CHANGES

Few respondents noted any changes in such physical environmental features as the air, the water, the climate, or the physical appearance of the town and surrounding area, although they were aware of the physical growth of the town. One change that was perceived almost universally was an increase in noise, which to many small town residents must certainly symbolize the shift from a small town way of life toward the way of life that characterizes big cities. The overcrowding that some respondents noticed probably means to them the same thing. In addition, in places where physical growth has been most extensive, i.e., Green River and Rock Springs, the pattern has been unmistakably suburban; the physical appearance and ambience of the new areas are not western, are not small town. The new areas look like new areas in the surrounding suburbs of any big city: strip commercial developments, car orientation (e.g., large parking lots, many drive-in facilities), tract homes, chain stores, and residential areas with cul-de-sacs and curving lanes. Thus as the culture of the communities changes from that of small town to that of mass society, the physical appearance of the towns undergoes the same change, starting to resemble, if not urban areas, at least suburban ones.

CHAPTER V

ANALYSIS OF THE RESULTS

Most of the effort that went into the CONSTRUCTION WORKER PROFILE STUDY was devoted to the collection and processing of large quantities of data. From the very beginning, however, it was clear that the ultimate objective of the study was to supplement understanding of the ways in which construction projects affect those communities close to them. In particular, it was necessary to know more about the size of the population influx which could be expected to directly accompany a construction project. Pursuit of this information required two steps. First, observations were needed on several projects so that the extent of the variations in population influx could be observed. The second step was to determine whether the variations from project to project could be explained.

The purpose of the preceding chapters of the FINAL REPORT has been primarily to describe what was and is happening on several construction projects and in the communities which have been affected by them. Although some generalizations appear to be strongly supported by the data, there is much that is unique to particular communities and particular projects. The object, therefore, of this chapter is to systematically investigate some of the most important relationships with which the study deals in order to determine the kinds of inferences that are supported by the data.

Four of the relationships investigated relate to the size and demographic composition of the population influx directly associated with a construction project. The actual population increase experienced by a community depends upon: (1) the extent to which non-local workers are employed on the projects, (2) the number of non-local workers who choose to live in the community in question, (3) the number of workers who are accompanied by their families, and finally, (4) the average size of the families that accompany the construction workers. In the first section of this chapter, the data from Chapters II and III applicable to these relationships are reviewed, hypotheses are developed and tested, relationships are quantified, and some indication is given of the applicability of the results to the impact assessment process.

The second section of the chapter looks briefly at the demand for housing. The actual distribution of households by dwelling unit is examined as is their satisfaction with their present home. An attempt is then made to determine the demanded type of unit (as opposed to type actually lived in) by examining how many households were willing and able to purchase another type of unit but were prevented from doing so because units were not available. Income-expenditure relationships are examined in the final section of the chapter.

As a preface to the analysis that follows, it should be clear that what has been done is indicative of the potential of the data base for further research, but represents only a fraction of the body of questions that can fruitfully be investigated. No attempt, for example, has been made to examine the way in which individual characteristics affect individual behavior. There is also a set of considerations relating to occupational mobility and labor force participation that is very important for purposes of impact assessment, but which has not yet been scrutinized. What follows is, therefore, only a beginning of what will hopefully be extensive and productive use of the CONSTRUCTION WORKER PROFILE data base.

I. ESTIMATION OF INCREASES IN POPULATION ASSOCIATED WITH CONSTRUCTION PROJECTS

A. SOURCE OF SUPPLY MODEL

The source of supply model represents an attempt to predict the number of local construction workers that will work on a given project. For an employee to be defined as local, he must not have changed his community of residence when he began working on the project. Non-local workers represent, therefore, new residents in communities in the vicinity of the project and are the principal determinant of socio-economic impact. Table V-1 shows the ratio of local to total workers for the 14 projects of the Project Survey arrayed from the project with the highest ratio to the one with the lowest. The object of the analysis that follows is to determine whether project to project variation in the number of local workers can be explained by characteristics of the projects and of the communities near them.

1. Hypotheses

The hypotheses developed in the source of supply model can most easily be explained in the context of the hypothetical situation shown in Figure V-1. Assume that project 1 is

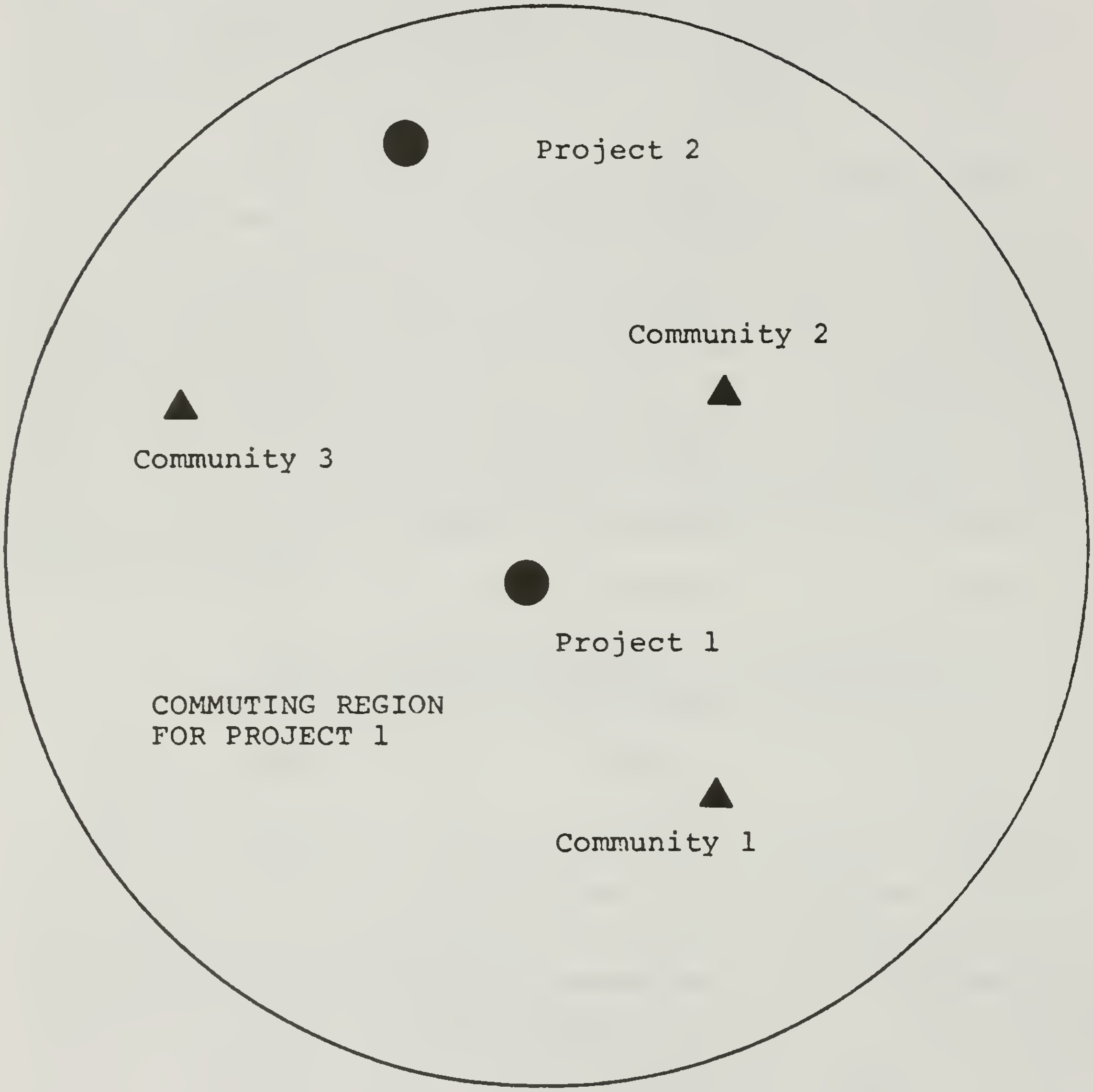
TABLE V-1

RATIO OF LOCAL TO TOTAL CONSTRUCTION WORKERS

Project Name	Location	Ratio
San Juan	New Mexico	.786
Emery	Utah	.531
Center	North Dakota	.479
Huntington	Utah	.463
Leland Olds	North Dakota	.446
Sun Oil	Northeast Wyoming	.429
Craig	Colorado	.420
Lake Expansion	Northeast Wyoming	.417
Coronado	Arizona	.403
Colstrip	Montana	.385
Hayden	Colorado	.321
Jim Bridger	Southwest Wyoming	.296
Texas Gulf Sulphur	Southwest Wyoming	.260
Wyodak	Northeast Wyoming	.032
TOTAL ALL PROJECTS		.399

FIGURE V-1

HYPOTHETICAL ARRANGEMENT OF COMMUNITIES AND PROJECTS



being analyzed and that within the 'daily commuting region' for project 1, there are three communities, and there is one other project.[1] The question of interest is the number of local workers that each of the three communities can be expected to supply to project 1. Five simple hypotheses were developed about the way in which the variables shown in Figure V-1 would be interrelated.

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[1] The term 'daily commuting region' is defined more precisely below. In general, it includes all places from which it would be possible to commute daily to work on a particular project.

Hypothesis 1: the number of local workers supplied by community i to project j (LW_{ij}) will be positively related to the size of community i (C_i).

Hypothesis 2: the number of local workers supplied by community i to project j will be a positive function of the total number of employees on project j (P_j).

Hypothesis 3: the number of local workers supplied by community i to project j will be inversely related to the distance between i and j (D_{ij}), and the effect of distance LW_{ij} may be non-linear.

Hypothesis 4: To the extent that workers from i are already employed on projects other than j within the project's commuting region (i.e., $\sum_{m=1}^{2} LW_{im}$ for $m \neq j$), LW_{ij} will be diminished.

Hypothesis 5: the larger the other communities within the project's commuting region (i.e., $\sum_{n=1}^{3} C_n$ for $n \neq 1$, the smaller will be LW_{ij}.

Hypothesis 4 takes account of the fact that the supply of construction workers within i is limited and; therefore, the local supply of workers available to one project will be diminished by the existence of other projects. Hypothesis 5 reflects the possibility that the number of jobs available to the residents of a given community may be limited if there are large competing sources of supply within the commuting region.

2. Empirical Results

The data from the Projects Survey provided 68 observations on LW_{ij} for which either community i supplied five or more workers to a project, or for which five or more percent of the local workers on the project were from community i.[2] Seven communities, for example, supplied enough local workers to the Coronado Plant in Arizona to meet one or the other of these criteria, while for the Hayden and Craig projects there were only four communities that qualified. Except in three instances, no community qualified that was at a distance of more than 100 miles,[3] so the commuting region was confined to a circle around the project with a radius equal to 100 miles.

For each of the 68 observations on LW_{ij}, estimates were obtained of the population of the community (C_i), of the number of employees on the project (P_j), of the road mileage between community i and project j (D_{ij}), of the aggregate population of other communities within the commuting region (OC), and of the total employment on other projects within the commuting region (OP). Ordinary least squares was then used to estimate the coefficients of an equation of the following form:

$$LW_{ij} = a_0 + a_1 C_i + a_2 P_j + a_3 D_{ij}^{\alpha} + a_4 OC + a_5 OP \qquad \text{(V-1)}$$

Several versions of the equation were estimated letting the value of α vary from 1 to 3 and allowing more than a single distance variable to enter. The empirical results are shown in equation (V-2) where the numbers in parentheses below the estimated coefficients are the calculated t-ratios.[4]

$$\begin{aligned} LW_{ij} = 12.723 &+ \underset{(17.05)}{.0024} C_i + \underset{(3.85)}{.055} P_j \qquad \text{(V-2)} \\ &- \underset{(9.93)}{.006} D_{ij}^{2.5} - \underset{(2.17)}{.172} OP - \underset{(.78)}{.0003} OC \qquad R^2 = .529 \end{aligned}$$

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[2] If fewer than 5 percent of the local workers were from a given community, the datum was judged to be too unreliable to be used to estimate the parameters of the source of supply model.

[3] The most important exception is Billings which supplies 28.4 percent of the local workers to Colstrip over a distance of 136 miles. The other exceptions are the towns of Orem and American Fork, Utah, which supplied 7 percent and 5 percent of the local workers to Huntington from distances of 104 and 108 miles, respectively.

[4] With 62 degrees of freedom, the null hypothesis can be rejected at the .95 level when t=1.66 on a one-tail test.

Judging from the statistical significance of the coefficients on the first four variables, hypotheses 1-4 receive strong support. The sign on the competitive effect is as expected (negative), but the coefficient is not significantly different from zero at the .95 confidence level. Overall, the independent variables account for nearly 53 percent of the variance of LW_{ij}. There is obviously much variance left (47 percent), but equation (V-2) represents a good start in the direction of understanding the quantitative determinants of the supply of local workers to a major construction project.

3. Applicability of the Results

There is no single prediction associated with socio-economic assessment of construction worker impacts more important than that of the number of non-local workers who will migrate into the project region. A principal objective of this study was therefore, to gather primary data on the local/non-local distribution of workers on 14 large construction projects under way in the nine state region during the summer of 1975. It was established that the mean ratio of non-local workers to the total was .601, but that there was considerable variation in this ratio from a high of .968 (Wyodak) to a low of .214 (San Juan). Consequently, several hypotheses were developed in an attempt to understand the determinants of the local/non-local distribution of workers. These hypotheses were tested, and the magnitude of the effects quantified, as was explained in the previous section. The results showed that the variables as a group explained a large proportion of the variation in the local/non-local composition of the construction force.

Nevertheless, it is essential not to read more into these results than is justified. First, there remained a substantial amount of variation (.47) that was not accounted for by the explanatory variables. It is easy to think of variables (contract provisions for hiring of local labor, variation due to procedures followed by particular unions or particular contractors, effects of national conditions in the construction industry at the time of project start-up) that might add to the explanatory power of the model but which were not pursued here. Second, the results represent only the average relationships observed for the 14 projects and are subject to the possibility of change in the future.

It is essential to avoid creating the impression that the local/non-local composition of the work force can be predicted in a mechanical way. All that can appropriately be claimed is that more is now known about the way in which project size, community size, and distance between project and community will interact to determine the supply of local workers than was the case before this study. This means that once the specifics of a particular situation have been carefully considered, it should be possible to make better judgments about local supplies of labor. It is equally true, however, that mechanical application of the results in the absence of careful analysis of the specifics of a particular situation can lead to judgments inferior to those which could have been obtained by careful field research of specifics alone.

Some insight into the applicability of the regression equation (V-2) can be gained from a careful examination of the sample data. For each of the 68 observations the value of LW_{ij} predicted by the model was calculated. The local workers supplied to the jth project were then summed for all communities within the commuting region of the jth project, and this sum equals the estimated supply of local workers to project j which is denoted in Table V-2 as $\hat{LW}$.[5] The projected number of non-local workers NL on a project can then be derived by subtracting $\hat{LW}$ from the total number of construction workers employed. Table V-2 then goes on to compare the actual and the predicted numbers of non-local workers so that the prediction errors for the sample projects can be calculated in both absolute and relative terms.

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[5] Actually, one further adjustment was necessary. As indicated above, observations on LW_{ij} were only included in the data set for the regression if they supplied at least five persons or five percent of the local labor to a particular project. Therefore, $\sum_i LW_{ij}$ used in the regression was less than $\sum_i LW_{ij}$ in the entire data set. If the sum of the observations used in the regression totaled .85 of the observed total, the predicted number was inflated (by dividing by .85) so that it could be compared directly to the total number of local workers on each project.

It should also be noted that WYODAK was excluded from the analysis here because only 3 workers responding to the questionnaire were local.

TABLE V-2

REGRESSION MODEL PROJECTIONS OF LOCAL AND NON-LOCAL WORKERS[a]

Project Name	Total Workers	Estimated Local Workers $\widehat{LW}$	Estimated Non-Local Workers $\widehat{NL}$	Actual Non-Local Workers NL	Error in Predicting Non-Local Workers $\widehat{NL}-NL$	Percentage Error $\frac{\widehat{NL}-NL}{NL}$
1 Coronado	152.6	88.9	63.7	91.0	- 27.3	.30
2 Craig	487.3	198.2	288.8	282.5	6.3	.02
3 Hayden	754.7	268.5	486.2	512.5	- 26.3	.05
4 Colstrip	731.8	195.2	536.6	450.0	86.6	.19
5 Center	521.4	240.2	281.2	271.4	9.8	.04
6 Leland Olds	603.1	297.8	305.3	334.4	- 29.1	.09
7 San Juan	497.9	288.2	209.7	106.4	103.3	.97
8 Emery	232.1	153.8	78.3	108.9	- 30.6	.28
9 Huntington	438.6	270.3	168.3	235.7	67.4	.29
10 Jim Bridger	838.3	208.9	629.4	590.0	39.4	.07
11 Lake Expansion	298.6	147.4	151.2	173.9	- 22.7	.13
12 Sun Oil	198.5	20.4	178.1	113.4	64.7	.57
13 Texas Gulf	372.1	189.6	182.5	275.4	- 92.9	.34

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[a] Numbers for each project inflated to population estimates based on sample proportions.

TABLE V-3

SIMPLE MODEL PROJECTIONS:
ESTIMATED NON-LOCAL WORKERS EQUALS .601 OF TOTAL

Project Name	$\hat{NL}$	$\hat{NL}-NL$	$\frac{\hat{NL}-NL}{NL}$
1 Coronado	91.7	- .7	.01
2 Craig	292.9	- 10.4	.04
3 Hayden	453.6	58.9	.11
4 Colstrip	439.8	10.2	.02
5 Center	313.4	- 42.0	.15
6 Leland Olds	362.5	- 28.1	.08
7 San Juan	299.2	-192.8	1.81
8 Emery	139.5	- 30.6	.28
9 Huntington	263.6	- 27.9	.12
10 Jim Bridger	503.8	86.2	.15
11 Lake Expansion	179.5	- 5.6	.03
12 Sun Oil	119.3	- 5.9	.05
13 Texas Gulf	223.6	51.8	.19

Table V-2 shows that the results are mixed. San Juan and Sun Oil both have very large errors, while for five of the projects, the errors are less than ten percent. The median percentage error is 19 percent, while if the absolute values of the errors are summed for all thirteen projects and divided by total non-local workers, the mean error is 16 percent. For comparative purposes, Table V-3 shows the projection results for the sample communities obtained from the simple hypothesis that the number of non-local workers will be a constant proportion (.601) of total workers. For San Juan this yields twice as large an error, but for several of the remaining projects the percentage error is somewhat smaller: over all 13 projects the mean percentage error is .14 for the simple model as compared to .16 for the regression model. For seven of the projects the simple model has the smaller percentage error, while for five projects the regression model has the smaller error.

Based on these results, the following approach seems most sensible. If project- and community- specific information were not available and it was necessary to estimate the expected number of non-local workers for a project, .601 (the sample mean) of the projected total number of workers is as good an estimate as can be made. If there is specific information about the communities and any other projects in the region, an estimate of the non-local workers should be made using the regression model, and it should be compared to the simple model. If the two are similar, and if there does not seem to be any project-specific circumstances providing evidence which would make the estimates suspect, the projection of non-local workers could be made with considerable confidence.

When the two estimates differ, the problem is more difficult, but the very fact that they diverge and that there is more uncertainty is itself important planning information. The next step would involve an analysis of the divergence. For example, if there are only a few small towns at great distances from the project, the regression model will project a much higher non-local proportion than would the sample mean for the 13 projects, but clearly there is no reason to support the simple projection. In other cases, however, there will be good reason to suspect that the regression model is incorrect (for example, there may be contract provisions requiring the hiring of certain numbers of local workers), and the judgment of the researcher will have to be used both in making an estimate and in describing its limitations.

B. COMMUNITY CHOICE MODEL

Once an estimate has been made of the number of non-local workers expected on a project, the next step is to estimate where the workers will choose to live within the commuting region. Will their residential choices reflect preferences with respect to community size, and does distance from the project site affect choice of community? Are there other variables that seem to influence community choices?

1. Hypotheses

The residential choice model is based on the idea that the relative attractiveness of communities can be measured by observing the relative numbers of non-local in-migrants from a given project who settled in each. Specifically,

$$NL_i = \left(\frac{A_i}{A}\right) TNL, \qquad \text{(V-3)}$$

where: NL_i is the number of non-local workers settling in the community i,

TNL is the total number of non-local workers on a project,

A_i is the attractiveness of the ith community, and

A is the sum of A_i over all communities.

The basic hypotheses of the model center on the determinants of community attractiveness. Equation (V-4) gives a very simple formulation that says the attractiveness of the ith community as a place of residence for non-local workers from the jth project is related by a multiplicative constant to the size of the community (C_i) and on the distance separating the community and the project (D_{ij}).

$$A_i = k\left(\frac{C_i}{D_{ij}^{\beta}}\right) \qquad \text{(V-4)}$$

This is obviously a simple hypothesis, and its rationale is discussed more critically below. First, however, it is necessary to see how the hypotheses in equations (V-3) and (V-4) can be tested and how the effect of distance (i.e. the value of β) can be estimated.

The assumption is made that the number of non-local residents in community 1 (NL_1) relative to the number in community 2 (NL_2) is a reflection of the attractiveness of 1 (A_1) relative to 2 (A_2). That is,

$$\frac{NL_1}{NL_2} = \frac{A_1}{A_2}$$

or in general, for any pair of communities s and t,

$$\frac{NL_s}{NL_t} = \frac{A_s}{A_t} \qquad \text{for } s,t = 1,2, \ldots n,$$

where n is the number of communities in the commuting region of project j. Substituting equation (V-4) for A_s and A_t,

$$\frac{NL_s}{NL_t} = \left(\frac{C_s/D_{sj}^{\beta}}{C_t/D_{tj}^{\beta}}\right) \qquad \text{(V-5)}$$

Ordinary least squares can then be used to estimate the distance elasticity (β) once equation (V-5) is made linear by taking a logarithmic transformation.

$$\log NL_s - \log NL_t = (\log C_s - \log C_t) - \beta(\log D_{sj} - \log D_{tj}). \qquad \text{(V-6)}$$

Every pair of communities within the commuting region of a project provides an observation on relative attractiveness, and the Project Survey provided a total of 93 such observations as the basis on which the hypotheses behind (V-6) can be tested.

The validity of the model depends on the assumptions that the attractiveness of a community increases with its size (at least over the range of sizes considered in this study) and, equally important, that the ability and speed with which a community can expand to absorb new residents is also a function of size. Support for this contention comes from considerations like the ease of generating credit for purposes of residential construction or the level of sophistication of the managers of municipal services. The effect of distance is to reduce desirability, but, as with the source of supply model, the important question concerns the quantitative magnitude of the effect.

2. Empirical Results

If the non-local workers on a project distribute themselves between two communities, then there is only a single observation on relative attractiveness (i.e., NL_1/NL_2). If there are three communities, however, there are three observations (NL_1/NL_2, NL_1/NL_3, NL_2/NL_3), and for four communities there are six observations. In general, where N is the number of communities, the number of observations in the regression model equals N(N-1)/2. For the fourteen projects, there were 93 observations on relative attractiveness.[6] The regression result obtained using ordinary least squares is shown below in equation (V-7).

$$\frac{NL_s}{NL_t} = \left(\frac{C_s/D_{sj}^{.849}}{C_t/D_{sj}^{.849}}\right). \qquad \text{(V-7)}$$

The coefficient of determination is .265 and the distance coefficient is highly significant with a t-ratio of 5.91.

The absolute size of the distance coefficient (.849) indicates that the effect of distance on community attractiveness is very nearly linear.[7] Examination of the residuals from (V-7) revealed that they were not randomly distributed by project. This is not unexpected and indicates that some variables specific to the region was acting systematically to affect community choice. For example, an initially small community may have been quicker to provide housing than would be expected on the basis of its size, and therefore ended up with many of the non-local workers as residents even though there may have been larger communities in the near vicinity.

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[6] There is a question about whether communities should be included as long as they are in the commuting region even if the number of non-local workers residing there equals zero. These were finally excluded on the basis that the relative relationships among very small numbers were not felt to be reliable.

[7] The null hypothesis that $\beta = 1$ cannot be rejected at the .99 level of significance.

The extent of the regional variation in the explanatory power of the model was investigated by re-estimating the model for geographic subregions. There were four areas, each of which included a pair of projects, for which there was a sufficient number of observations to re-estimate the model. The results are in Table V-4. The results for the Colorado, North Dakota, and Utah areas are quite good in terms of overall explanatory power, but the size of the estimated parameters varies substantially from area to area. What this means is that the community choice model can explain much of the variation in the choice of place of residence, but that the explanation is specific to a particular region. It would presumably be applicable to other communities in the same region, but could not confidently be applied to situations outside the sample regions. The North Dakota and Utah results are based on a large enough set of observations and seem sufficiently reasonable that they could be useful for prediction purposes as will be explained below. The results for the Craig-Hayden projects are problematic because they are based on such a small set of observations and the results for the Rock Springs-Green River area are even less useful. Variables other than community size and distance must have been important in determining the distribution of the non-local workers from the Jim Bridger and Texas Gulf projects, since size and

TABLE V-4

SUBGROUP REGRESSION RESULTS FOR COMMUNITY CHOICE MODEL

Projects	$\hat{\beta}$	t-ratio	degrees of freedom	$\bar{R}^2$[a]
Craig-Hayden	.528	4.369	8	.506
Center-Leland Olds	1.661	8.533	26	.730
Emery-Huntington	1.267	4.860	15	.611
Jim Bridger-Texas Gulf	.306	.801	24	0
TOTAL	.849	5.914	92	.265

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[a] $\bar{R}^2$ is the coefficient of determination adjusted for degrees of freedom.

distance explain none of the variance of the dependent variable. The information in the Rock Springs-Green River COMMUNITY REPORT sheds light on why this may be so.

The results from the test of the community choice model must, therefore, be characterized as mixed. With the exception of the southwest Wyoming area, the hypotheses underlying community choice were supported by the data obtained in the Project Survey. The quantitative magnitude of the parameters varied substantially from area to area, however, indicating that region-specific characteristics such as provision of housing by construction companies, provision of transportation to construction sites from certain communities, etc. have to be taken into account before much progress can be made in predicting the communities where non-local construction workers will choose to settle.

3. Applicability of the Results

The nature of the results and their shortcomings were described in the previous section. Fortunately, the community choice model does not play as important a role in most short-run impact assessments as do other relationships--namely, those having to do with source of labor supply and family size. The reason is that accommodation of large numbers of workers and their families is not something that occurs instantaneously. It requires public services extensions, issuance of building permits, etc. Hence, a close look at the residential alternatives (and at current plans) one or two years prior to project start-up will tell much about where workers will locate. In many cases the alternatives are so restricted that a serious prediction problem does not exist.

The more serious prediction problem arises in the context of longer term scenarios where it is either impossible or impractical to make inferences from community-specific analyses. In this kind of situation, the model would be capable of making reasonable predictions for three of the major energy-development areas, Utah, North Dakota, and Northwestern Colorado and the results for the entire sample (equation V-7) could be used for other regions. The limitations of the model would have to be understood, but some knowledge of the relevant empirical relationships is better than no knowledge.

The steps involved in the application of the model are as follows:

(1) First, using the source of supply model (or some ad hoc procedure), forecast the number of non-local workers expected to be associated with the project being analyzed.

Let this variable be denoted $\hat{NL}$. The problem then is to allocate $\hat{NL}$ among the communities within the commuting region of the project.

(2) List all communities within the commuting region, their populations (even better would be estimated populations at time of construction), and their distances from the project.

(3) For each of the communities, substitute populations and distances into the formula.

$$\hat{A}_s = C_s / D_{sj}^{\hat{\beta}} \quad , \qquad \text{(V-8)}$$

where $\hat{\beta}$ is the parameter estimate thought relevant to the region in question and C_s and D_{sj} are the actual values of the population and distance variables for community s.

(4) Use the A values to allocate NL to each community, that is,

$$\hat{NL}_s = \frac{\hat{A}_s}{\sum_{i=1}^{n} \hat{A}_i} \cdot \hat{NL}, \text{ where } i = 1, \ldots, s, \ldots n.^{8}$$

Suppose, for example, that a situation exists such as that shown in Figure V-2 where three communities of varying sizes lie within commuting distance of a single project. Assume further that it has been estimated that 180 non-local construction workers will be moving into the region to work on the project (i.e. $\hat{NL} = 180$). The problem, therefore, is to allocate workers among the three communities. Assume that little is known about the area and that the most reasonable way to proceed is to assume that this region is similar, on the average, to the fourteen projects in the Project Survey.

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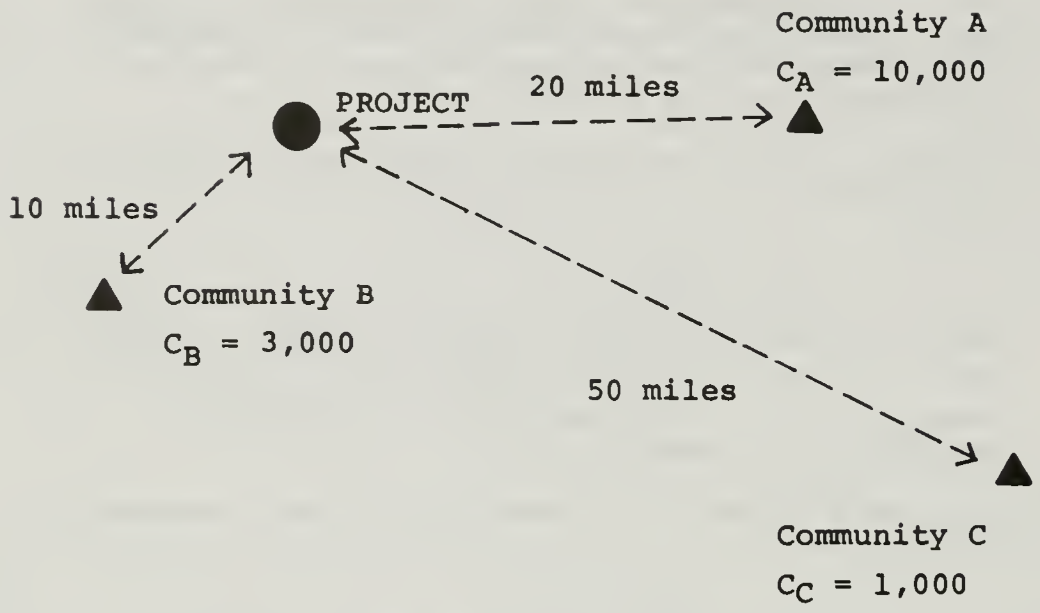
[8] The multiplicative constant k from equation V-4 would appear in both the numerator and denominator of this expression and would cancel out. The value of $\hat{NL}_s$ is, therefore, independent of k and it is left out of equation V-8.

FIGURE V-2

HYPOTHETICAL COMMUNITY CHOICE PROBLEM



The parameter estimate for the entire sample ($\hat{\beta} = .849$) will therefore be used.

$$\hat{A}_A = \frac{10,000}{20^{.849}} = 786.0$$

$$\hat{A}_B = \frac{3,000}{10^{.849}} = 424.7, \text{ and}$$

$$\hat{A}_C = \frac{1,000}{50^{.849}} = 36.1.$$

Summing the A's and then taking the ratio of each to the total, the following allocation factors are derived:

	Allocation Factor
Community A	.63
Community B	.34
Community C	.03

The estimate of 180 non-local workers are, therefore, allocated 113 to A, 62 to B, and 5 to C.

C. POPULATION INFLUX ASSOCIATED WITH NON-LOCAL WORKERS

Once the number of non-local workers expected to move into a community has been estimated, the next step is to project the number of dependents that can be expected to accompany them. The number of dependents will result from the interaction of the following:

(1) the proportion of the non-local workers who are married;

(2) the proportion of the married non-local workers who bring their families with them; and

(3) the average family size of the workers whose families accompany them.

Table V-5 is reproduced here from Chapter II for the sake of convenience and shows how the three relationships identified above vary over the 14 projects. The last column shows that while the population influx per 100 non-local workers for Jim Bridger is very high and that for Sun Oil is low relative to the others, nine of the remaining twelve projects had a total population influx within 10 percent of the mean for all projects (227.8 persons), and the population influxes for the remaining four projects were only slightly over 10 percent away from the mean.

The high number of dependents observed for Jim Bridger suggested a plausible hypothesis associated with the second factor discussed above. Perhaps the proportion of married non-local workers bringing their families with them would depend partly on the length of time the project had been under construction. The simple correlation coefficient between these two variables (project stage and proportion of married non-local workers with families present) was positive, but only equaled .41 for the 14 projects. The hypothesis testing was carried further by determining whether the distance-weighted sum of community populations within the commuting region might have a positive effect on the decisions of workers to bring their families with them. Again, the simple correlation coefficient was of the anticipated sign, but small (.39). The effects of commuting region population and project duration were examined in regression equations, but neither coefficient (individually or when both were included) was significantly different from zero at the .90 confidence level. Because community-specific observations could be used in both the source of supply and the community choice models, there were 68 and 93 observations respectively. For the marital status and family size analysis,

TABLE V-5

AVERAGE POPULATION INFLUX PER 100 NON-LOCAL CONSTRUCTION WORKERS

Project Number and Name	Worker Single, Widowed, or Divorced	Worker Married, but Family Absent	Family Present			Total Population Influx per 100 Non-Local Construction Workers
			Worker	Spouse	Children	
1 Coronado 1,2,3	8.7	30.4	60.9	60.9	69.6	230.5
2 Craig 1,2--Yampa Power Plant	27.2	30.8	42.0	42.0	57.4	199.4
3 Hayden 2	22.8	31.1	46.2	46.2	64.4	210.7
4 Colstrip 1,2	34.0	24.7	41.2	41.2	94.8	235.9
5 Center--Milton R. Young	25.0	36.1	38.9	38.9	69.4	208.3
6 Leland Olds	17.1	37.1	45.7	45.7	78.1	223.7
7 San Juan 1	21.7	21.7	56.5	56.5	73.9	230.3
8 Emery	13.3	46.7	40.0	40.0	73.3	213.3
9 Huntington 2	10.6	34.8	54.7	54.7	93.8	248.6
10 Jim Bridger 2,3	21.3	14.0	64.7	64.7	123.0	287.7
11 Texaco Lake Expansion	34.2	24.6	41.2	41.2	56.1	197.3
12 Sun Oil--Cordero Mine	65.3	17.3	17.3	17.3	28.0	145.2
13 Texas Gulf Sulphur	32.9	25.7	41.3	41.3	67.7	208.9
14 Wyodak	21.6	18.2	60.2	60.2	67.0	227.2
TOTAL ALL PROJECTS	24.6	26.5	48.9	48.9	78.9	227.8

there were only 14 observations and further hypotheses with respect to these data were therefore not pursued. For the present, it seems wisest to begin by assuming that the mean population influx per 100 non-local workers observed for all 14 projects (227.8) will characterize new projects in the region. This should then be evaluated and modified as seems appropriate in light of conditions specific to a particular project or the region in which it will be located.

D. CHARACTERISTICS OF THE DEPENDENT POPULATION

The demands made on the public and private facilities of a community depend not only on the number of new residents but on their characteristics. Most important is the age distribution of the children because of its implications for education planning, but other characteristics of the population may also be important. The strategy taken in this study was to try to maximize the response to the Project Survey questionnaire by keeping it brief. Characteristics can then be attributed to the Project Survey respondents on the basis of the substantially more detailed information obtained in the Household Survey. A crucial question became, therefore, the degree of correspondence between the two data sets and the extent to which the information from one could be used to supplement that from the other.

The Household Survey was conducted with residents of nine affected communities and as such was intended only to be representative of the population of each community except that the experimental design insured adequate representation of certain subpopulations of interest. The Project Survey represented an attempt to survey all workers on a project. Newcomer construction workers interviewed in the Household Survey correspond to non-local construction workers in the Project Survey and so the two sets of respondents were compared with respect to family size. The subgroup of particular interest is the married workers with family present since they account for 77.6 percent of the population influx experienced by the communities (176.7 of 227.8 persons based on the average for all 14 projects). Table V-6 shows that the married non-local workers with their families present identified in the Project Survey had an average family size almost identical to that of the married newcomer construction workers in the Household Survey.

There is one definitional problem that must be made clear with respect to the Project Survey data. The only question about family size asked of married respondents was the number of children younger than 18. The question was asked

TABLE V-6

FAMILY SIZE--MARRIED WORKERS, FAMILY PRESENT

	Family Size
Projects Survey--14 Projects, Non-Local Workers, N = 901	3.61
Household Survey--5 currently affected communities, Newcomer Construction Workers, N = 303	3.59

in this way to get an estimate of the number of children living with the family under the assumption that children under 18 would live at home and those over 18 would not. Answers to the question only approximated the information desired, but asking the question in this manner was thought to be more efficient than trying to ask explicitly about the number of children living at home with the family, wherever home might be.[9] The result is that the Project Survey family size estimate is low to the extent there are children 18 years old or older living at home locally with the family. It tends to be an overestimate to the extent that respondents have any children under the age of 18 who are not with the family at its local address. This could be the case with older children left behind in previous locations to finish school, and there might also be some children by prior marriages that would be included in the response, but who would not be present locally. Because none of these effects are likely to be very large (Table V-7 shows that of the newcomer construction worker children identified in the Household Survey, only 4.7 percent were 18 or older) and because the Household Survey family size estimate is not subject to these problems and is within .02 persons of the Project Survey estimate, no adjustment will be made to the Project Survey estimate, and the families represented by it will be assumed to have the same age distribution of children as do the newcomer construction worker families in the Household Survey. The age distribution of children obtained in the Household Survey is shown in Table V-7.

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[9] This approach was devised in light of obvious confusion associated with this question in the pre-test.

TABLE V-7

HOUSEHOLD SURVEY--AGE DISTRIBUTION OF CHILDREN FOR NEWCOMER CONSTRUCTION WORKERS, FAMILY PRESENT

Age	Percentage of Children
less than 5	35.7
5-11	36.3
12-14	11.3
15-17	10.6
18-19	3.5
20-24	1.9
24-29	.6
	99.9

TABLE V-8

EXPECTED POPULATION INFLUX FOR 100 NON-LOCAL CONSTRUCTION WORKERS WITH AGE DISTRIBUTION OF CHILDREN

		Number of Persons
Single, Widowed, or Divorced Workers		24.6
Married Workers, Family Absent		26.5
Married Workers, Family Present		48.9
Spouses		48.9
Children (Total)		78.9
less than 5	28.2	
5-11	28.6	
12-14	8.9	
15-17	8.4	
18-19	2.8	
20-24	1.5	
25-29	.5	
TOTAL		227.8

The implication of Table V-7 is that for a population influx of 100 non-local workers, the age distribution of the children accompanying them would be as shown in Table V-8. The table shows that for each 100 non-local workers, a total of 78.9 children can be expected based on the average of the 14 projects and that 45.9 of these children will be of school age.

II. DEMAND FOR HOUSING

Provision of adequate housing for new community residents has been a difficult problem for all of the communities that have been, or are presently being, affected by large construction projects. The purpose here is to use the CONSTRUCTION WORKER PROFILE Household Survey data to describe the types of units people in those communities are actually living in and to make inferences about the type they would live in if units of all types were available in the local market at prices existing at the time of the survey.

Information was derived from a series of questions designed to distinguish between the type of unit respondents indicated they would like to live in and the type of unit they would be willing and able to purchase if it were available. The first category is referred to as housing demand. Table V-9 shows that newcomer construction workers, other newcomers, and long-time residents have distinctly different housing needs.

The proportion of each of the three types of respondents living in single family homes ranges from only 19 percent for newcomer construction workers to 76 percent for long time residents. Of other newcomers interviewed in the survey, 44 percent were living in single family homes. If single family homes had been available in the local housing market, however, 34 percent of the newcomer construction workers, 55 percent of the other newcomers, and 81 percent of long-time residents indicated that they would have lived in single family units. The difference between the Actual and the Demanded in Table V-9 is greatest for the newcomer construction workers (15 percent), followed by the other newcomers (11 percent) and long time residents (5 percent).

The data for mobile homes reflect the same basic relationships as do the data for single family homes. Fifty-three percent of newcomer construction workers lived in mobile homes while the figures for other newcomers and long time residents are 32 percent and 18 percent, respectively. When the newcomer

TABLE V-9

HOUSING TYPE, PREFERENCES AND DEMAND FOR THE FIVE CURRENTLY AFFECTED COMMUNITIES

	Number of Workers			Percentage		
Type of Unit	Actual[a]	Preferred[a]	Demanded[a]	Actual	Preferred	Demanded
			NEWCOMER CONSTRUCTION WORKERS			
Single Family	76	181	136	.19	.46	.34
Duplex, Townhouse	7	5	6	.02	.01	.02
Apartment	40	30	36	.10	.08	.09
Mobile Home	212	151	181	.53	.38	.46
Other	62	30	39	.16	.08	.10
	397	397	397	1.00	1.01	1.01
			OTHER NEWCOMERS			
Single Family	133	212	167	.44	.70	.55
Duplex, Townhouse	15	11	13	.05	.04	.04
Apartment	49	21	39	.16	.07	.13
Mobile Home	97	51	77	.32	.17	.25
Other	10	4	7	.03	.01	.02
	304	304	304	1.00	.99	.99
			LONG TIME RESIDENTS			
Single Family	267	306	284	.76	.87	.81
Duplex, Townhouse	4	2	4	.01	.01	.01
Apartment	15	10	14	.04	.03	.04
Mobile Home	62	31	47	.18	.09	.13
Other	3	3	3	.01	.01	.01
	351	351	351	1.00	1.01	1.00

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[a] Actual indicates respondent's present housing type, preferred is respondent's indicated preference, and demanded is type respondent indicates would be purchased if it were available.

construction workers were asked to indicate their preferred type of housing, only 38 percent indicated mobile homes. This percentage rose to 46 percent, however, when those respondents who were either unwilling to buy, or unable to afford, their preferred type were added back into the mobile home demand category. They were considered not to be demanding their preferred type, since they would in fact live in mobile homes even if other housing were available. It appears, therefore, that only about 7 percent of the newcomer construction workers (53 percent minus 46 percent) would actually have given up their mobile homes if their preferred housing type had been available. The percentages for other newcomers and long time residents were 7 and 5 percent, respectively.

With respect to other housing types, there were only small differences between the actual, the preferred and the demanded types of units. The conclusions that can be based on Table V-9 include the fact that there are unmet demands for single family residential units, and that there is a small group of persons (6.8 percent of all respondents) living in mobile homes only because other types of housing are not available. Nevertheless, a large part of the dissatisfaction with housing seems to stem from cost rather than availability considerations. Something can be done about availability, but the cost of housing in these communities, as elsewhere in the United States, is not likely to decrease.

III. INCOME AND EXPENDITURES

Everything discussed in this chapter to this point has been oriented toward estimating the direct consequences of a large construction project on nearby cities and towns. The major concern has been to try to establish how many non-local construction workers would have to move into the region, how many dependents they would bring with them, and where they would choose to live. Once progress has been made with these so-called direct consequences of the project, attention has to be directed to the set of indirect or induced effects that result from the project. The phenomenon responsible for these effects is called the multiplier and results from the stimulating effect of the new residents on the local economy. As the incomes of the construction workers are spent, the demand for locally produced goods and services increases which in turn increases local incomes and employment which leads to further increases in the demand for goods and services. The consequence of this process is that the new incomes being paid to construction workers will eventually increase local income by the amount of the new income plus some amount of indirect or induced income. For example, if $100 of new income were paid to construction workers and if an additional $40 of indirect income were generated, then the original $100 has generated a total increase of $140, and the multiplier would be equal to 1.4.

The size of the multiplier is important in an impact assessment and, although there is much to the calculation of the multiplier that is beyond the scope of the discussion here, the income and expenditure data collected in the Household Survey are important inputs into any such calculation. The basic questions concern the income of the workers, the amount of that income that is spent, and the amount of total spending that is done within the local area. Evidence on each of these pieces of information is contained in Table V-9 for the Household Survey communities. The information for the two pre-impact and the two post-impact communities is listed for each community individually. For the five currently affected communities, an average is given for newcomer construction workers, other newcomers, and long time residents. The means for the entire sample in the currently affected communities are not meaningful because the sampling procedures were explicitly designed to over-represent newcomer construction workers and other newcomers in order that the representation of the subgroups in the sample be large enough to support analysis.

Perhaps the most striking feature of Table V-10 is the overall high level of income for the currently affected communities. Most conspicuous is the mean income of the newcomer construction workers which was nearly $19,000 annually. The comparable rates for other newcomers and long time residents were $15,722 and $13,953, respectively. It appears, therefore, that there is community-wide participation in the economic prosperity that accompanies large-scale energy development. The long time residents in the currently affected communities were earning substantially more than the residents of Conrad, Killdeer, or St. George. The mean family income in Langdon is of an order of magnitude comparable to incomes of the long time residents in the currently affected communities.

The expenditure to income ratio (E/I) and the local expenditure to total expenditure ratio (LE/E) are both important in the impact assessment process. The difference between expenditure and income reflects tax payments, savings, and the extent to which respondents underestimated their expenditures. For the U.S. as a whole, consumption averaged between 77.3 and 77.7 percent of personal income over the period 1971-

TABLE V-10

MONTHLY HOUSEHOLD INCOME AND EXPENDITURES--ALL COMMUNITIES

	Income (I)	Total Expenditures (E)	Saving (S)	Local Expenditures (LE)	E/I	LE/E	S/I
Pre-Impact							
Killdeer	648.15	422.06	48.31	234.65	.651	.556	.075
St. George	990.62	632.21	41.22	361.49	.638	.572	.042
Combined Currently Affected							
Newcomer Construction Workers	1579.76	1009.11	156.98	500.81	.639	.496	.099
Other Newcomers	1310.21	895.41	85.58	550.29	.683	.615	.065
Long Time Residents	1162.78	737.68	102.10	431.78	.634	.585	.088
Post-Impact							
Conrad	839.86	516.61	52.23	355.71	.615	.689	.062
Langdon	1105.56	647.97	97.86	415.84	.586	.642	.089

1973.[8] For the residents of Killdeer, St. George and for the residents of the currently affected communities, E was from 63 to 68 percent of household income. The most likely reason that the ratio was lower here is that retirement, insurance, and other payroll deductions were not reported as expenditures by the respondents. The Langdon and Conrad ratios of .586 and .615 respectively were even lower. There is some support for the proposition that their expenditures as a percentage of income are lower than for the United States because saving in all of the communities with the exception of St. George exceeded the national saving to personal income ratio which in 1973 was .052.[9] Nevertheless, the larger amount of saving is not enough to account for the low E/I ratio and hence it appears that expenditures have been even more seriously underestimated by these respondents than by repondents in the currently affected communities.

The ratios of local to total expenditures for the survey communities show that about one-half to two-thirds of expenditures are made localoy. Interestingly, newcomer construction workers have a substantially lower ratio than any other group. This very likely is a reflection of the fact that many of the workers are married, but unaccompanied by their families.

---

[8] 1974 Economic Report of the President, Table C-17, Disposition of Personal Income, p. 268.

[9] *Ibid.*

APPENDIX A

TABULAR RESULTS FROM HOUSEHOLD SURVEY FOR POST-IMPACT COMMUNITIES

TABLE A-1

FAMILY SIZE COMPARISONS POST-IMPACT COMMUNITIES, MONTANA, NORTH DAKOTA, AND THE UNITED STATES[a]

Place	Average Number of Persons Per Family
Post-impact communities:	
Total Population	3.47
Newer Residents	3.32
Long Time Residents	3.56
Montana	3.62[b]
North Dakota	3.72[b]
United States:	
Total Population	3.57[b]
Rural Population	3.67[b]

---

[a] For the purposes of this report, a family is composed of a head of household and other household members related to the head by blood, marriage, or adoption. Spouses and children were the only relatives of the head included in these data. All families included at least two persons.

[b] Source: U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C.: U.S. Government Printing Office, 1973), p. 1628.

TABLE A-2

AVERAGE NUMBER OF CHILDREN IN VARIOUS AGE CATEGORIES (FOR EACH 100 FAMILIES) POST-IMPACT COMMUNITIES

Age Category	Average Number of Children
Under 5	45
5-11	53
12-14	18
15-17	19
18-19	10
20-24	4
25 or over	1
TOTAL	150

TABLE A-3

HOUSEHOLD DISTRIBUTION BY SIZE OF HOUSEHOLD POST-IMPACT COMMUNITIES AND THE U.S.

Size of Household	Percentage of Households	
	Post-Impact Communities	United States[b]
One person	13.4	19.1
Two persons	29.6	30.8
Three persons	16.8	17.1
Four persons	21.2	15.6
Five persons	8.9	9.3
Six persons	5.6	4.4
Seven or more persons	4.5	3.8
TOTAL[a]	100.0	100.0

---

[a] Totals may not add to 100.0 percent because of rounding.

[b] Source: U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington, D.C.: U.S. Government Printing Office, 1974), p. 14.

TABLE A-4

MEDIAN AGE COMPARISONS POST-IMPACT COMMUNITIES, MONTANA, NORTH DAKOTA AND THE UNITED STATES

Place	Median Age
Post-impact communities	25.32
Montana	27.10[a]
North Dakota	26.40[a]
United States:	
Total Population	28.10[a]
Rural Population	27.90[a]

---

[a] Source: U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C., U.S. Government Printing Office, 1973), p. 1-310.

TABLE A-5

AGE DISTRIBUTION - HOUSEHOLD HEADS POST-IMPACT COMMUNITIES AND THE UNITED STATES

	Percentage of Household Heads	
Age Categories	Post-Impact Communities	United States[a]
14-24	9.5	8.4
25-34	36.3	20.5
35-44	12.9	16.8
45-64	23.4	34.5
65 or over	17.9	19.9
TOTAL[b]	100.0	100.0

---

[a] U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households, (Washington, D.C.: U.S. Government Printing Office, 1974), p. 2.

[b] Totals may not add to 100.0 percent because of rounding.

TABLE A-6

AGE DISTRIBUTION
POST-IMPACT COMMUNITIES AND THE UNITED STATES

Age Categories	Percentage of Residents: Post-Impact Communities	Percentage of Residents: United States[a]
Under 15	31.9	28.4
15-19	9.5	9.4
20-24	6.3	8.1
25-34	23.3	12.2
35-44	8.2	11.4
45-54	6.8	11.5
55-64	5.4	9.1
65 or over	8.4	9.9
Total[b]	100.0	100.0

---

[a] Source: U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population (Washington, D.C. U.S. Government Printing Office, 1973), p. 1-263.

[b] Totals may not add to 100.0 percent because of rounding.

TABLE A-7

EDUCATIONAL ATTAINMENTS (HIGHEST GRADE COMPLETED) POST-IMPACT COMMUNITIES, MONTANA, NORTH DAKOTA AND THE UNITED STATES[a]

Highest Educational Level Completed	Percentage of Residents			
	Post-Impact Communities	Montana[c]	Dakota[c]	United States[c]
Less than High School Graduation	21.0	40.8	49.7	47.7
High School Graduate	33.8	34.0	27.6	31.1
Some College	21.3	14.1	14.3	10.6
College Graduate	15.2	6.9	5.2	6.1
Some Graduate School	4.3	4.1	3.2	4.6
Advanced Degree	1.5			
Vo-Technical School	2.7	----	----	----
TOTAL[b]	100.0	100.0	100.0	100.0

---

[a] Educational attainments for household heads and spouses are included for the post-impact communities. Data for Montana, North Dakota, and the United States were reported for persons 25 and over. Because of the method of data analysis for the Household Survey, it was not possible to present data for persons 25 and over only. Some household heads and spouses were under 25, but none listed his/her occupation as "student," and so all were assumed to have completed their educations. As a result of the procedure of including only heads and spouses in this analysis, some household members over 25 (7 persons) were left out of the post-impact communities educational attainment data presented here.

[b] Totals may not add to 100.0 percent because of rounding.

[c] Source: U.S. Bureau of the Census, 1970 Census of Population: Characteristics of the Population, United States Summary (Washington, D.C.: U.S. Government Printing Office, 1973), pp. 1-493, 1-494.

TABLE A-8

EDUCATIONAL ATTAINMENTS OF HOUSEHOLD HEADS (HIGHEST GRADE COMPLETED) POST-IMPACT COMMUNITIES AND THE UNITED STATES

	Percentage of Household Heads	
Highest Educational Level Completed	Post-Impact Communities	United States[a]
Less than High School Graduation	26.8	39.1
High School Graduate	28.5	32.7
Some College	16.8	13.1
College Graduate	16.2	
Some Graduate School	5.6	15.1
Advanced Degree	2.2	
Vo-Technical School	3.9	----
TOTAL	100.0	100.0

---

[a] Source: U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington, D.C.: U.S. Government Printing Office, 1974), p. 7.

TABLE A-9

OCCUPATIONS OF HOUSEHOLD HEADS
POST-IMPACT COMMUNITIES

Occupation	Percent[a]
Professional, technical, kindred	20.1
Managerial	12.8
Sales	4.5
Craftsmen, foremen, kindred	11.7
Clerical and kindred	5.0
Operatives, except transport	3.4
Transport equipment operatives	1.1
Laborers except farm	4.5
Farmers, farm foremen, farm laborers	7.3
Service workers, except private household	6.7
Private household workers	1.1
Retired	18.4
Students	2.8
Unemployed	0.6
TOTAL	100.0

---

[a] Percentages for Professional and Managerial groups will not agree with those discussed in preceding paragraph because this table includes retired and unemployed persons.

TABLE A-10

INDUSTRY OF EMPLOYED HOUSEHOLD HEADS[a]
POST-IMPACT COMMUNITIES

Industry	Percent
Agriculture, Forestry, Fisheries	10.4
Mining	0.6
Construction	7.5
Manufacturing	6.9
Transportation, Communications, Utilities	13.9
Wholesale Trade	1.2
Retail Trade	15.0
Finance, Insurance, Real Estate	3.5
Personal Services	4.6
Health and Recreation	1.2
Professional and Educational Services	8.7
Public Administration	1.2
Other Industry	6.4
Armed Forces	19.1
TOTAL[b]	100.0

---

[a] Unemployed and retired persons were not included for this analysis.

[b] Totals may not add to 100.0 percent because of rounding.

TABLE A-11

OCCUPATIONS OF WORKING SPOUSES POST-IMPACT COMMUNITIES

Occupation	Percentage of Working Spouses
Professional, technical, kindred	20.8
Managerial	7.5
Sales	13.2
Clerical and kindred	37.7
Service Workers	18.9
Private Household Workers	1.9
TOTAL	100.0

TABLE A-12

INDUSTRY OF EMPLOYED SPOUSES
POST-IMPACT COMMUNITIES

Industry	Percentage of Working Spouses
Transportation, Communications, Utilities	5.7
Retail Trade	35.8
Finance, Insurance, Real Estate	5.7
Personal Services	3.8
Health and Recreation	15.1
Professional and Educational Services	24.5
Public Administration	3.8
Other Industry	3.8
Armed Forces	1.9
TOTAL[a]	100.0

---

[a] Total may not add to 100.0 percent because of rounding.

TABLE A-13

ANNUAL HOUSEHOLD INCOME
POST-IMPACT COMMUNITIES AND THE UNITED STATES

Income Category	Percentage of Residents Post-Impact Communities	 United States[b]
Less than $4,000	9.2	17.5
$ 4,000-$ 5,999	6.1	10.4
$ 6,000-$ 7,999	10.1	9.9
$ 8,000-$ 9,999	13.4	9.7
$10,000-$11,999	12.3	9.7
$12,000-$14,999[a]	14.5	12.9
$15,000-$24,999[a]	20.8	22.1
$25,000 and over[a]	10.8	7.8
No Response	2.8	----
TOTAL	100.0	100.0

---

[a] Income data for the Household Survey were collected for $2,000 intervals. These categories do not match published U.S. Census income categories exactly. The $12,000-$14,999 category is a census category which corresponds to the $12,000-$13,999 category in the Household Survey. The $15,000-$24,999 category is a census category which corresponds to five household survey categories including incomes between $14,000 and $23,999. The $25,000 and over category is a census category which corresponds to nine household survey categories including incomes of $24,999 and over.

[b] Source: U.S. Bureau of the Census, Consumer Income: Household Money Income in 1973 and Selected Social and Economic Characteristics of Households (Washington, D.C.: U.S. Government Printing Office, 1974), p. 14.

TABLE A-14

AVERAGE HOUSEHOLD EXPENDITURES BY CATEGORY POST-IMPACT COMMUNITIES

Expenditure Category	Average Monthly Expenditures	Average Local Monthly Expenditures
Housing	$107.87	$107.87
Utilities	53.69	------[a]
Automobile Payments and Service	86.55	62.45
Insurance and Medical	54.75	17.09
Groceries	134.45	125.84
Amusement, Travel, and Other	121.45	69.30
TOTAL	$558.76	$382.55

---

[a] Utilities expenditures were assumed to be nonlocal.

TABLE A-15

PLANS FOR STAYING IN THE AREA
RESIDENTS OF POST-IMPACT COMMUNITIES

Plans	Percent of Respondents
Settle down here	63.7
Leave immediately	10.1
Stay as long as work is available	17.3
Uncertain	5.6
Leave at retirement	2.8
Stay until transferred	0.6
TOTAL[a]	100.0

---

[a] Total may not add to 100.0 percent because of rounding.

TABLE A-16

SOURCES OF SOCIAL CONTACT RESIDENTS OF POST-IMPACT COMMUNITIES[a]

Source	Percentage of Residents: Newer Residents (5 years or less)	Percentage of Residents: Long Time Residents (more than 5 years)	Percentage of Residents: Total Population
Work	71.2	56.0	62.2
Church	27.1	39.3	34.3
Bars	20.3	9.5	14.0
Clubs and Community Activities	37.3	45.2	42.0
Recreation	23.7	15.5	18.9
Relatives	11.9	16.7	16.8
Neighborhood	50.8	48.8	49.7
School	10.2	25.0	18.9
Other	1.7	8.3	5.6

---

[a] Respondents were asked to list the three most important sources of social contact, so percentages add to more than 100.0 percent.

TABLE A-17

SATISFACTION/DISSATISFACTION WITH COMMUNITY FACILITIES NEWER RESIDENTS VS. LONG TIME RESIDENTS[a]

		Percentage of Residents	
Service		Newer Residents	Long Time Residents
Law Enforcement:	Satisfied	60.8	64.8
	Dissatisfied (or No Service)[b]	17.6	16.2
Fire Protection:	Satisfied	73.0	99.0
	Dissatisfied	2.7	----
Water:	Satisfied	73.0	83.8
	Dissatisfied	21.6	13.3
Sewer:	Satisfied	79.7	85.7
	Dissatisfied	17.6	7.6
Garbage Collection:	Satisfied	95.9	89.5
	Dissatisfied	2.7	2.9
Streets and Roads:	Satisfied	35.1	45.7
	Dissatisfied	55.4	41.9
Medical Services	Satisfied	68.9	87.6
	Dissatisfied	13.5	4.8
Entertainment:	Satisfied	40.5	53.3
	Dissatisfied	39.2	30.5
Shopping:	Satisfied	68.9	85.7
	Dissatisfied	25.7	9.5
Schools:	Satisfied	58.1	83.8
	Dissatisfied	6.8	4.8
Housing Availability:	Satisfied	50.0	47.6
	Dissatisfied	39.2	27.6
Housing Quality:	Satisfied	51.4	61.0
	Dissatisfied	61.0	15.2

---

[a] Totals of "satisfied" and "dissatisfied" categories will not usually add to 100.0 percent because some respondents answered "uncertain", and those percentages are not included in this table.

[b] The category "No Service" was included with each "Dissatisfied" because frequently the respondent indicated there was no service for a category when in fact that service was provided. It was felt that this was a measure of dissatisfaction in those cases because the service would have to be fairly poor for the respondent not to know it was being provided.

TABLE A-18

TYPE OF DWELLING LIVED IN POST-IMPACT COMMUNITIES

Dwelling Type	Percentage of Households
Single Family:	
2 bedroom	19.9
3 bedroom	24.4
4 bedroom	10.8
5 bedroom	3.4
Other	5.1
Duplex, townhouse, condominium	0.6
Apartment	11.9
Mobile Home	21.6
Other	2.3
TOTAL	100.0

APPENDIX B

INTERVIEW FORMS FOR HOUSEHOLD SURVEY

#______ ____________________
community

1. How long have you lived in (or near) this community? ______________

2. Family present_____or absent_____? (Observe when possible.)

3. Complete items A-E for all household members. Circle the household member number of the respondent.

Household Members

A. Relationship	1	2	3	4	5	6	7	8
Head of household								
Spouse								
Son or daughter of head								
Other relative of head								
Roomer, Boarder, Lodger								
Other unrelated to head								
B. Sex: Male								
Female								
C. Age: (actual age)								
D. Years of School Completed:								
less than H.S. Grad								
H.S. Grad								
College (no degree)								
College Graduate								
Some Grad. School								
Advanced degree								
Vo-tech School								
E. Marital Status:								
Now married								
Widowed or divorced								
Never married								

Please
Do Not
Write
In This
Column

1-1 _____
1-2 _____
1-3 _____
1-4 _____
1-5 _____
1-6 _____
1-7 _____
1-8 _____
1-9 _____
1-10 _____
1-11,12 _____
1-13 _____
1-14 _____
1-15 _____
1-16 _____
1-17,18 _____
1-19 _____
1-20 _____
1-21 _____
1-22 _____
1-23,24 _____
1-25 _____
1-26 _____
1-27 _____
1-28 _____
1-29,30 _____
1-31 _____
1-33 _____
1-33 _____
1-34 _____
1-35,36 _____
1-37 _____
1-38 _____
1-39 _____
1-40 _____
1-41,42 _____
1-43 _____
1-44 _____
1-45 _____
1-46 _____
1-47.48 _____
1-49 _____
1-50 _____
1-51 _____
1-52 _____
1-53,54 _____
1-55 _____
1-56 _____

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Colum

4. What is the principal occupation of the household head?

______________________________ 1-57 ___
(examples: teacher, carpenter, clerk) 1-58 ___

In what kind of business or industry is his/her job? (probe) 1-59 ___
1-60 ___

____
(examples: school, power plant, supermarket; if energy-related, name of project)

5. How long has the household head worked at this job? ____________ 1-61 ___

a. What was the household head's previous occupation? 1-62 ___
______________________________ 1-63 ___

b. In what business or industry? ____________ 1-64 ___
1-65 ___

c. Why did he/she change jobs? 1-66 ___
______________________________ 1-67 ___

6. Do any other household members have jobs outside the home? yes ____ no ____ 1-68 ___
(Do not code.) 1-69,70 ___

If yes, complete the following grid: 1-71,72 ___

	Household Members		
	#2	#3	#4
relationship to head:	______	______	______
occupation:	______	______	______
industry:	______	______	______
how long at present job:	______	______	______
previous occupation:	______	______	______
previous industry:	______	______	______
Why the job change?	______	______	______

1-73 ___
1-74,75 ___
2-1,2 ___
2-3,4 ___
2-5 ___
2-6,7 ___
2-8,9 ___
2-10 ___
2- 11,12 ___
2- 13,14 ___
2-15,16 ___
2-17 ___
2-18,19 ___
2-20,21 ___
2-22 ___
2-23,24 ___
2-25,26 ___
2-27,28 ___

7. a. Do you drive to work? yes_____ no_____ (Do not code.)

b. If yes, how far do you drive?(one way) ______________miles. 2-29 ___

How long does it take? (one way) ______________. 2-30 ___

c. If no, how do you get to work?______________. 2-31 ___

How far is it to work? (one way) ______________ miles. 2-32 ___

How long does it take? (one way) ______________. 2-33 ___

Please
Do Not
Write
In This
Column

How do the other members of your household who have jobs get to work?

#2	#3	#4
_________method	_________method	_________ method
_________miles (one way)	_________miles (one way)	_________miles(one way)
_________time	_________time	_________time

2-34 _____
2-35 _____
2-36 _____
2-37 _____
2-38 _____
2-39 _____

Are most of your best friends here: _____people who have lived here longer than you have?

_____people who moved here at about the same time you did?

_____people who are newer to the area than you are?

2-40 _____
2-41 _____
2-42 _____
2-43 _____

Where did you meet most of your friends, or people with whom you socialize most frequently, in this area? (Rank top 3)

_____at work
_____at church
_____at local bars
_____at clubs or community activities
_____at recreation activities
_____through relatives
_____in your neighborhood
_____at school
_____other

2-44 _____
2-45 _____
2-46 _____

Do you own _____ or rent _____ your home?

2-47 _____

How many bedrooms are there in this house? ____________bedrooms

2-48_____

Is your present type of housing the most satisfactory one for you, or would you prefer to live in another type?

Present type satisfactory_____
different type preferable_____

2-49 _____

If you would prefer to live in another type of housing, what type would you most prefer? (probe)

____

2-50 _____

Why aren't you living in the type of housing you most prefer?(probe)

____

____

2-51 _____
2-52 _____

How long do you expect your present job to last?______________________

2-53 _____

What are your plans for staying in this area? Do you plan to:

_____ settle down here
_____ leave immediately
_____ stay as long as work is available
______uncertain
_____ other (specify)
____

2-54 _____

18. How satisfied are you with each of the following services in your area?

	very satisfied	satisfied	uncertain	dissatisfied	very dissatisfied	no service	Do Not Write In This Column
a. law enforcement	1	2	3	4	5	6	2-55 ___
b. fire protection	1	2	3	4	5	6	2-56 ___
c water supply	1	2	3	4	5	6	2-57 ___
d. sewer service	1	2	3	4	5	6	2-58 ___
e garbage collection	1	2	3	4	5	6	2-59 ___
f. streets and roads	1	2	3	4	5	6	2-60 ___
g. medical services	1	2	3	4	5	6	2-61 ___
h. outdoor sports	1	2	3	4	5	6	2-62 ___
i. indoor sports	1	2	3	4	5	6	2-63 ___
j. amusements(restaurants, movies, etc.)	1	2	3	4	5	6	2-64 ___
k. shopping facilities	1	2	3	4	5	6	2-65 ___
l. town government	1	2	3	4	5	6	2-66 ___
m. civic and service clubs	1	2	3	4	5	6	2-67 ___
n. schools	1	2	3	4	5	6	2-68 ___
o. mental health services	1	2	3	4	5	6	2-69 ___
p. availability of housing	1	2	3	4	5	6	2-70 ___
q. quality of housing	1	2	3	4	5	6	2-71 ___

19. Are there other services I haven't mentioned which are particularly satisfactory or unsatisfactory? Yes______ No ______

2-72 ___
2-73 ___
2-74 ___
2-75 ___

	Satisfactory	Unsatisfactory
If yes, which services?	______________	______________
	______________	______________

20. Now I'd like to ask you some questions about your household expenditures. I realize that this information is personal, but please remember that all of the information you give me will be kept entirely confidential.

	Average Amount Per Month	or	Amount Per Year	% Local	% Non-local	
Housing(rent or mortgage payment)	________		________	______	______	3-1,2,3 ___ 3-4 ___
Telephone	________		________	______	______	3-5,6,7 ___ 3-8 ___
Electricity	________		________	______	______	3-9,10 ___ 3-11 ___
Natural Gas	________		________	______	______	3-12,13 ___ 3-14 ___
Fuel Oil	________		________	______	______	3-15,16 ___ 3-17 ___

No. of cars owned: _____
(Do not code)

	Average Amount Per Month	or	Amount Per Year	% Local	% non-local		Please Do Not Write In This Column
Automobile (payments)	_____		_____	_____	_____	3-18,19,20 3-21	_____ _____
Gasoline & Car Repairs	_____		_____	_____	_____	3-22,23,24 3-25	_____ _____
Medical Expenses and health insurance payments (excl. those automatically deducted from paycheck)	_____		_____	_____	_____	3-26,27,28 3-29	_____ _____
Life insurance payments (excl. those automatically deducted from paycheck)	_____		_____	_____	_____	3-30,31 3-32	_____ _____
Auto Insurance	_____		_____	_____	_____	3-33,34 3-35	_____ _____
Groceries	_____		_____	_____	_____	3-36,37,38 3-39	_____ _____
Restaurants, Bars, Amusements	_____		_____	_____	_____	3-40,41,42 3-43	_____ _____
Travel (vacations, etc.)	_____		_____	_____	_____	3-44,45,46 3-47	_____ _____
Other (clothing, gifts, etc.)	_____		_____	_____	_____	3-48,49,50 3-51	_____ _____
Savings	_____		_____	_____	_____	3-52,53,54 3-55	_____ _____

21. How much money is automatically deducted from your paycheck for health insurance? $ __________ 3-56 _____
3-57 _____

22. What is your take-home pay? $ __________ per week, bi-monthly, per month (circle one) 3-58 _____
3-59 _____

Please
Do Not
Write
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Column

LONGTIME RESIDENTS (A)

Now I'd like to ask you a few questions about your reaction to the energy-related construction that's been going on around here. 3-60 ___

1. Have the actual effects of the construction on the community/area been
   about what you expected ____________ 3-61 ___
   better than you expected ____________
   worse than you expected ____________

   If better or worse, in what way(s)? 3-62 ___
   3-63 ___
   3-64 ___
   3-65 ___

2. Have you gotten to be friends with any people who have moved here within the last ___________ years? Yes_____ No _____ 3-66 ___

3. In terms of your overall feelings, would you say you are glad ______ or unhappy_______ that the project came here? 3-67 ___

   Why? 3-68 ___
   3-69 ___
   3-70 ___
   3-71 ___

4. In which of these ranges would your yearly family income (before taxes) fall into? (use card)

A. _____less than $2000
B. _____$2000 -$3999
C. _____$4000-$5999
D. _____$6000-$7999
E. _____$8000-$9999
F. _____$10000-$11999
G. _____$12000-$13999
H. _____$14000-$15999
I. _____$16000-$17999
J. _____$18000-$19999
K. _____$20000-$21999
L. _____$22000-$23999
M. _____$24000-$25999
N. _____$26000-$27999
O. _____$28000-$29999
P. _____$30000-$31999
Q. _____$32000-$33999
R. _____$34000-$35999
S. _____$36000-$37999
T. _____$38000-$39999
U. _____$40000 or more

3-72 ___
3-73 ___

(DO NOT ASK A - C. OBSERVE.)

A. Address ____

B. Anglo 1 Hispano 2 Nat. American Indian 3 Negro 4 Oriental 5 3-74 ___

C. Type of Dwelling: 3-75 ___

SF - 2 bedrooms _____
SF - 3 bedrooms _____
SF - 4 bedrooms _____
SF - 5 bedrooms _____
Other SF _____

duplex, townhouse, condominium _____
apartment _____
mobile home _____
other _____

THANK YOU VERY MUCH FOR YOUR COOPERATION.

Please
Do Not
Write
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Column

LONGTIME RESIDENTS (B)

Now I'd like to ask you a few questions about your reaction to the construction of the missile site near here.

3-60 ____

1. Did you expect your community/area to change when the site began to be built? yes _______ no _______

4-1 ____

If yes, in what way(s)?

4-2 ____
4-3 ____
4-4 ____
4-5 ____

2. Were the actual effects of the construction on the community/area

about what you expected? __________
better than you expected? __________
worse than you expected? __________

4-6 ____

If better or worse, in what way(s)?

4-7 ____
4-8 ____
4-9 ____
4-10 ____

3. In which of these ranges would your yearly family income (before taxes) fall into? (use card)

A. ____ less than $2000
B. ____ $2000-$3999
C. ____ $4000-$5999
D. ____ $6000- $7999
E. ____ $8000-$9999
F. ____ $10000-$11999
G. ____ $12000-$13999
H. ____ $14000-$15999
I. ____ $16000-$17999
J. ____ $18000-$19999
K. ____ $20000-$21999
L. ____ $22000-$23999
M. ____ $24000-$25999
N. ____ $26000-$27999
O. ____ $28000-$29999
P. ____ $30000-$31999
Q. ____ $32000-$33999
R. ____ $34000-$35999
S. ____ $36000-$37999
T. ____ $38000-$39999
U. ____ $40000 or more

4-11 ____
4-12 ____

(DO NOT ASK A - C. OBSERVE.)

A. Address ______________________________

B. Anglo	Hispano	Nat. American Indian	Negro	Oriental
1	2	3	4	5

4-13 ____

C. Type of Dwelling:

SF - 2 bedrooms ____
SF - 3 bedrooms ____
SF - 4 bedrooms ____
SF - 5 bedrooms ____
Other SF ____

duplex, townhouse, condominium ____
apartment ____
mobile home ____
other ____

4-14 ____

THANK YOU VERY MUCH FOR YOUR COOPERATION.

Please
Do Not
Write
In This
Column

LONGTIME RESIDENTS (C)

Now I'd like to ask you a few questions about the energy-related construction proposed for this area. 3-60 ____

1. Do you expect your community/area to change when the project begins to be built? yes ______ no ______ 4-15 ____

   If yes, in what way(s)? 4-16 ____ 4-17 ____

   4-18 ____ 4-19 ____

2. Do you think the net effect of the project construction will be good for the community, or bad for it? good ______ bad ______

   Why? 4-20 ____ 4-21 ____

   4-22 ____ 4-23 ____

3. In which of these ranges would your yearly family income (before taxes) fall into? (use card)

A. _____less than $2000
B. _____$2000-$3999
C. _____$4000-$5999
D. _____$6000-$7999
E. _____$8000-$9999
F. _____$10000-$11999
G. _____$12000-$13999
H. _____$14000-$15999
I. _____$16000-$17999
J. _____$18000-$19999
K. _____$20000-$21999
L. _____$22000-$23999
M. _____$24000-$25999
N. _____$26000-$27999
O. _____$28000-$29999
P. _____$30000-$31999
Q. _____$32000-$33999
R. _____$34000-$35999
S. _____$36000-$37999
T. _____$38000-$39999
U. _____$40000 or more

4-24 ____
4-25 ____

(DO NOT ASK A - C. OBSERVE.)

A. Address ____

B. Anglo 1 Hispano 2 Nat. American Indian 3 Negro 4 Oriental 5 4-26 ____

C. Type of Dwelling: 4-27 ____

SF - 2 bedrooms _____
SF - 3 bedrooms _____
SF - 4 bedrooms _____
SF - 5 bedrooms _____
Other SF _____
duplex, townhouse, condominium _____
apartment _____
mobile home _____
other _____

THANK YOU VERY MUCH FOR YOUR COOPERATION.

NEWCOMERS

Please
Do Not
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Column

3-60 ____

If respondent has indicated that his family (spouse and/or children) is absent, ask questions 1 and 2; if not, begin with question 3.

1. Sometimes, when a person begins a new job in a new area, he/she doesn't aways bring his/her family right away, in case things don't work out well immediately. I notice your family is NOT here with you. Can you tell me what reasons influenced the decision not to bring your family here? (probe)

4-38 ____
4-39 ____
4-40 ____
4-41 ____
4-42 ____

2. Do you hope to bring your family here? yes ______ no ______

If yes, when? ____________________

3. Have the other household members lived here for the same length of time as the household head? yes ______ no ______

If not, how long did the household head live here before the rest of the household moved here? ____________________

4-43 ____
4-44 ____
4-45 ____
4-46 ____

4. What was the location of your (head of household's last job, just before coming here? ____________________

4-47 ____
4-48 ____

5. What was your (head of household's) occupation there? ____________________
____________________.

4-49 ____

6. How far did you (head of household) live from your place of work there?
______________ miles.

4-50 ____
4-51 ____

a. Did you drive to work? yes ______ no ______

b. How long did you live there? ____________________

c. (If respondent has a family, ask:)

Did your family live there with you? yes ______ no ______

If no, why not?

4-52 ____
4-53 ____
4-54 ____
4-55 ____
4-56 ____
4-57 ____
4-58 ____

7. a. For what reasons did you move here?

4-59 ____
4-60 ____

b. (If working on project), how did you learn about the job opportunities here? (probe: friend, rumor, sent by union, etc.

4-61 ____
4-62 ____

Please
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Write
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Column

8. Now, I'd like to ask you some questions about how you feel about living in (near) ______________________________ .
(name of town)
Please indicate the three words on the list below which best describe the ______________________ area as a place to live. (Rank top 2.) (card)

4-63 ___
4-64 ___
4-65 ___
4-66 ___
4-67 ___
4-68 ___

_____easy
_____happy
_____modern
_____lonely
_____competitive
_____impersonal
_____dull
_____exciting
_____conservative
_____rewarding
_____unfriendly
_____isolated
_____slow-moving
_____difficult
_____friendly
_____expensive
_____relaxed
_____dirty

9. What are the things you like MOST about living in ____________________?
(community)

4-69 ___
4-70 ___
4-71 ___
4-72 ___

10. What are the things you like LEAST about living in ____________________?
(community)

4-73 ___
4-74 ___
4-75 ___
5-1 ___

11. In which of these ranges would your yearly family income (before taxes) fall into? (use card)

5-2 ___
5-3 ___

A. _____less than $2000
B. _____$2000-$3999
C. _____$4000-$5999
D. _____$6000- $7999
E. _____$8000-$9999
F. _____$10000-$11999
G. _____$12000-$13999
H. _____$14000-15999
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J. _____$18000-$19999
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M. _____$24000-$25999
N. _____$26000-$27999
O. _____$28000-$29999
P. _____$30000-$31999
Q. _____$32000-$33999
R. _____$34000-$35999
S. _____$36000-$37999
T. _____$38000-$39999
U. _____$40000 or more

DO NOT ASK A - C. OBSERVE.)

A. Address ____

B.	Anglo	Hispano	Nat. American Indian	Negro	Oriental
	1	2	3	4	5

5-4 ___

C. Type of Dwelling:

5-5 ___

SF - 2 bedrooms _____
SF - 3 bedrooms _____
SF - 4 bedrooms _____
SF - 5 bedrooms _____
Other SF _
duplex, townhouse, condominium _____
apartment _____
mobile home _____
other _____